1999

Taking a transactional view of occupational stress into self-report management

Harlan Thomas Abson
University of Wollongong

Taking A Transactional View of Occupational Stress Into Self-Report Measurement

A thesis submitted in fulfilment of the requirements
for the award of the degree of

Doctor of Philosophy

From

University of Wollongong

by

Harlan Thomas Abson

B. Soc. Sc. (App. Soc. Sc.) *Mitchell College of Advanced Education, NSW*
B.A. (Honours) *University of Wollongong, NSW*

Department of Psychology
1999

Abstract

The more traditional descriptive methodologies used in stress research invariably disregard or discount the importance of the personal meaning assigned to sources of intrinsic and extrinsic stress in the stressor to strain process (Payne, Jabri & Pearson, 1988). This practice, therefore, may account for the consistent inability of descriptive stress inventories to explain more than a moderate percentage of the variance in strain.

This empirical thesis, therefore, has sought to explore the hypothesis that the nature of the personal meaning assigned to sources of occupational stress explains variance in strain beyond that explained by the person's description (i.e., recognition) of common work stressors. Specifically, it sought to demonstrate that self-report measurement of the personal meaning assigned to sources of stress in terms of expectancy, valence, belief and personal desirability enables a significant improvement in the prediction and understanding of occupational stress. In addition, it explores the relative importance of (a) personality dispositions (i.e., cognitive styles) and coping methods in the stressor to strain process; and (b) the ability of physical, psychological and composite measures of strain to capture the nature of the transactional process underlying occupational stress.

Seven empirical studies are presented and reflects the self-report data obtained from four work related samples and four student samples: i) studies one to four explore the relative effect of the personal meaning assigned to sources of stress in terms of expectancy, valence and personal belief on the variance in strain; ii) studies five and six explore the relative importance of the personal desirability assigned to common stressors in the stressor to strain outcomes; iii) study seven sought to (a) consolidate the findings from studies one to six; (b) demonstrate support for the relative importance of both specific and general dimensions of appraisal in the stressor to strain process; and (c) test the principal hypothesis of the thesis.

The results for studies one to four indicate that the expectancy assigned to common stressors and personal beliefs associated with social support demands explain variance in strain beyond that explained by the recognition of common stressors. Further, they show that the relative effect of significant expectancy and personal belief dimensions of appraisal add useful information to the variance in strain in models of best fit. The valence of common stressors and cognitive styles for Type A behaviour and locus of control, however, were not significant predictors of strain.

The results for studies five and six demonstrate that the nature of the personal desirability assigned to common stressors explains variance in strain beyond that explained by common sources of stress and dimensions of hardiness. In addition, they show that the appraisal of common stressors in terms of "Like More" "About Right" and "Like Less" each explain a significant percentage of the variance in strain. That is, they indicate that (a) the appraisal of an imbalance with common stressors corresponds to an increase in strain; (b) the appraisal of balance relates to a decrease in symptoms of strain; (c) that significant differences exist between mean strain scores corresponding to the appraisal of personal imbalance and balance with common stressors; and (d) that the nature and magnitude of the desirability imbalance (balance) with stressors corresponds to the magnitude of strain outcomes.

In addition, the results for study six show that dispositions for low and high hardiness discriminate the relative importance of hardiness cognitive styles in the stressor to strain relationship. From this result, it is concluded that two transactional models of stress may be seen to explain the transactional nature of the stressor to strain process. One a "value discrepancy" model which elevates the importance of recognition and personal meaning cognitive processes; the other a "mediational" model which reflects the efficacy of dispositional qualities in the stressor to strain process.

The results from study seven (n = 205) indicate that the relative effect of expectancy, belief and personal desirability dimensions of personal meaning account for an additional 16.10% (adj) of the variance in strain beyond that explained by common stressors. The expectancy and valence of common stressors, however, were not significant predictors of stain. Further, in models of best fit, dimensions of personal meaning account for a significant percentage of the variance in strain beyond that explained by significant common stressor, coping and hardiness predictors of strain. Equally noteworthy, in the final equation for each model, expectancies for psychological strain is the most powerful predictor of strain.

Hierarchical modelling demonstrates that the unique effect of expectancy, belief personal desirability dimensions of appraisal explains 12.10% (adj) of the variance in strain explained by the model of best fit (i.e., 51.70% adj); or, in proportional terms, dimensions of personal meaning account for 23.40% (adj) of the variance in strain explained by the model. Thus, on the basis of this result, there is in effect statistical and conceptual support for the principal hypothesis of the thesis. Subsequent analyses reveal that the unique effect of personal meaning and cognitive style dimensions of appraisal account for 23.75% (adj) of the variance in strain explained by the best fit model; or in proportional terms, they account for 45.95% (adj) of the variance explained by the model. Factor analyses subsequently confirmed the relative independence of (a) specific and general dimension of appraisal and (b) dimensions of personal meaning.

Taken together, the significant results indicate wide support for the empirical hypotheses of the respective studies; the aim of the thesis; and the principal hypothesis of the thesis. In essence, they serve to demonstrate that a "personalised" approach to the self-report measurement of occupational stress enables a significant improvement in the understanding of the transactional relationship between sources of stress and the

nature of strain outcomes. In effect, the results demonstrate (a) that nomothetic techniques may be usefully adopted to measure idiographic components of cognition; (b) that the effect of individual differences underlying the appraisal of intrinsic and extrinsic sources of stress may be seen to underpin the variability in strain related outcomes; and (c) increased support for the transactional view of occupational stress.

On the basis of these results, the thesis concludes that in contrast to the descriptive emphasis of the more traditional S-R formulations of occupational stress, the transactional relationship between stressors and strain may be reconceptualised in terms of an individualised S-O-R model of occupational stress. It indicates that specific and general dimensions of appraisal combine to shape the nature of the personal meaning assigned to common stressors. The appraisal of an imbalance with common stressors reflects as stress and thus an increase in symptoms of strain; the appraisal of balance with common stressors as personal satisfaction with the stressor and thereby reduced symptoms of strain. Furthermore, this conclusion suggests that both the traditional and individualised models of stress have theoretical and applied utility in stress research. The traditional model as a more general approach to occupational stress that accommodates the role of common stressors, cognitive styles and coping behaviours in strain related outcomes. The individualised model as either a diagnostic, benchmarking or intervention instruement that may be used to (a) discriminate sources of job stress and job satisfaction both within and across contexts and (b) guide to the design of work.

The nature of conceptual and measurement issues which underpin the efficacy and validity of stress research, the theoretical and practical utility of the findings, the limitations of the present research programme and recommendations for future research are discussed. The thesis concludes with a summary of the general conclusions drawn from this body of empirical research.

In the words of the ancient Greek philosopher Epictetus:

"People are disturbed not by things but the view they take of them"

Declaration

This thesis was completed under the supervision of Associate Professor Peter Smith, School of Organisational Behaviour and Human Resource Management, Griffith University, Qeensland. It is submitted in accordance with the regulations of the University of Wollongong in fulfilment of the requirements for the degree of Doctor of Philosophy.

I certify that this manuscript is entirely my own work. It has not been previously been submitted for a degree at another university or tertiary institution. The data reported in study one was published as proceedings of the British Psychological Society Industrial and Organisational Psychology Conference held in Brighton U.K. 1994. It was later published as refereed proceedings of the Australian Psychological Society Industrial and Organisational Psychology Conference held in Sydney, NSW, 1995.

Harlan Thomas Abson

Acknowledgements

I am indebted to a number of people and organisations without whose support and encouragement this doctoral thesis would not have been completed.

In particular, I would like to thank Professor Robert Barry, Head of the Department of Psychology, University of Wollongong, for his support, unceasing interest in the progress of my thesis and the opportunities he gave me to further my academic, professional and personal development. In addition, I would also like to thank the academic staff of the Psychology Department for their support, advice and interest in the progress of my thesis. Finally, I would like to thank the support staff of the department for their friendliness, cooperation and invaluable assistance toward the completion of my thesis over the period of time I have been associated with the department.

To my supervisor, Associate Professor Peter Smith, I am greatly indebted for his guidance, continual encouragement and commitment to the completion of this thesis. Without his extensive theoretical and practical knowledge of the topic area, professional expertise and faith in my ability I would not have been able to complete this thesis.

To my family - my wife Barbara and daughters Susan, Karen and Pamela, I am forever grateful for your love, support, encouragement and tolerance of my study commitments over the number of years it has taken me to complete this thesis.

Finally, to my friends from both Mitchell College and the University of Wollongong, I thank you for your unceasing interest in the progress of my thesis and encouragement over this very difficult period of study.

TABLE OF CONTENTS

Volume 1

Theoretical Basis and Rationale for the Thesis
≈
Expectancy/Valence and Evaluative Strands of Research
≈
General Discussion

LIST OF TABLES

Table **Page**

Study One

Study Two

Study 4

Chapter Three (Section Three)

Study 6

Study 7

LIST OF FIGURES

Figure **Page**

Chapter Two (Section One)

Chapter Two (Section Two)

Chapter Two (Section Three)

Study Four

Chapter Three (Section Three)

Volume 2

Appendices: Study 1 - Study 7

≈

References

Chapter 1

Introduction To Thesis
≈
Plan of Thesis

Chapter 1

1.1 Introduction to Thesis

This empirical thesis has sought to explore deficiencies in the self-report measurement and explanation of occupational stress. In particular, it is concerned with the inherent limitations of cognitive (i.e., descriptive) models of stress and the inability of current self-report measurement techniques to more fully explain the nature, dynamics and effects of occupational stress (Aldwin, 1994; Barone, 1995; Dewe, 1991a, 1992; Lazarus, 1995; Monroe & Kelley, 1995; Newton, 1989; Payne, Jabri, & Pearson, 1988). Accordingly, this thesis has sought to show (a) that a personal meaning approach to the self-report measurement of common work stressors is able to significantly improve the measurement and explanation of occupational stress; and (b) that it is indeed possible to operationalise the appraisal process in a transactional model of occupational stress.

1.2 The Conceptual Evolution and Limitations of Stress Research

Developments in the conceptual basis of theoretical models of stress depict the efforts of stress researchers to improve their understanding of the adjustment processes and central role of cognitive processes underlying the nature, sources and effects of psychosocial stress (Aldwin, 1994; Barone, 1995; DeFrank, 1988; Edwards & Cooper, 1988; Fisher, 1988; Hurrell, Jr., Nelson, & Simmons, 1998; Kahn & Byosiere, 1992; Kasl, 1978, 1984, 1987, 1996; Lazarus, 1995; Payne et al., 1988; Pratt & Barling, 1988; Schabracq & Cooper, 1998; Siegrist & Peter, 1994; Sutherland & Cooper, 1988; Tetrick, 1992; Vagg & Spielberger, 1998; Williams & Cooper, 1998). In essence, then, there is evidence of a conceptual and methodological evolution which reflects the movement of stress research from the dominance of the stimulus-response (S-R)

paradigm and the necessary reliance on objective methodologies (Frese & Zapf, 1988; Kasl, 1998); to (a) the use of more complex interactional and transactional formulations of stress and (b) a fundamental reliance on self-report methodologies (Cox & Ferguson, 1991; Karasek et al., 1998; Kasl, 1987, 1996, 1998; Lepore, 1995; Spector & Jex, 1998; Williams & Cooper, 1998). That is, this conceptual evolution reflects the transition of stress research from the use of S-R models of stress which explicitly avoid or deny the role of psychological factors in stress related outcomes (Aldwin, 1994; Barone, 1995; Frese & Zapf, 1988; Hurrell Jr. et al., 1998; Karasek et al., 1998; Poultan, 1978) to stimulus-organism-response (S-O-R) formulations of stress that recognise the importance of three contemporary factors: (a) the essential role of individual differences; (b) the involvement and functional role of cognitive appraisal processes; and (c) the dynamic and reciprocal nature of the stress process in stressor to strain relationships (Barone, 1995; Cox, 1978; Folkman & Lazarus, 1985; Harris, 1995; Lazarus, 1995; Lazarus & Folkman, 1987; Payne et al., 1988; Smith, Brown, Di Milia, & Wragg, 1993; Spielberger & Reheiser, 1995; Tetrick, 1992; Vagg & Spielberger, 1998).

Transactional theory is one example of the cognitive approach to the measurement and explanation of the stressor to strain relationship (Barone, 1995; Benner, 1984; Cox, 1978; Dewey & Bentley, 1949; Harris, 1995; Lazarus, 1966, 1967, 1995; Lazarus & Folkman, 1984; Lazarus & Launier, 1978; Payne, 1978; Pervin, 1967, 1968; Pervin & Lewis, 1978; Phillips & Orton, 1983; Schuler, 1982). In this theory, cognitive appraisal (i.e., personal meaning assigned to work stressors) is conceptualised to function as an intervening process or mediating factor which underlies the magnitude of the relationship between stressors and strain (Cox, 1978; Harris, 1995; Lazarus, Cohen, Folkman, Kanner, & Schaefer, 1980; Payne, 1991; Spielberger & Reheiser, 1995; Tetrick, 1992). For example, the appraisal of common work stressors in terms of

valence (i.e., as good or bad), expectancy (i.e., as likely or unlikely to cause stress) or personal desirability (i.e., desire for more or less of the stressor) may be seen to function as cognitive mediators of the transactional relationship between stress and strain (Ajzen & Fishbein, 1980; Arnold, 1967; Bandura, 1986; Edwards, 1992; Feather, 1992; James & Jones, 1974; Lazarus, 1966, 1967; Locke, 1969; Payne, 1979a; Schuler, 1980; Vroom, 1964; Zajonc, 1980).

However, in spite of such theoretical progress, stress research still remains essentially dominated by the continuing and often exclusive reliance on descriptive measurement (i.e., measurement in terms of agreement, frequency, duration or intensity) of the demand and resource components underlying person-environment fit (P-E fit) and transactional models of stress (Dewe, 1991a, 1992; Fineman & Payne, 1981; Kelloway & Barling, 1991; Narayanan, Menon, & Spector, 1999; Payne et al., 1988; Payne, Lane, & Leahy, 1989; Spector & Jex, 1998). This practice, therefore, has effectively impeded the progress of stress research.

1.3 Purpose of the Thesis

One fundamental and perplexing issue that continues to impedes the progress of stress research is the inability of stress researchers to operationalise the structural concepts of sophisticated (i.e., heuristic) theoretical models into methodological practice (Aldwin, 1994; Cox & Ferguson, 1991; Dewe, 1991a, 1992; Lazarus, 1995; Payne, 1991; Pratt & Barling, 1988; Shirom, 1982). In particular, the inherent complexity of the trans-actional approach to the measurement and explanation of stress provides a thoughtful and difficult challenge for stress researchers (Kasl, 1987, 1996). Indeed, this slippage or lag between conceptual models of stress and measurement models is seen to impose distinct limitations on the ability of stress research to explain (a) the dynamic nature of the stressor to strain process and (b) the transactional relationship between work

demands and personal resources in occupational stress (Aldwin, 1994; Cox & Ferguson, 1991; Dewe, 1991a, 1992; Dewe, Cox, & Ferguson, 1993; Frese & Zapf, 1988; Harris, 1995; Monroe & Kelley, 1995; Newton, 1989).

Stress research, therefore, will typically revert to the use of cross-sectional studies (Bohle, 1997; Spector & O'Connell, 1994) and more simple S-R paradigms to explain the transactional relationships underlying the process and effects of stress (Dewe, 1991a; Payne et al., 1988). Furthermore, descriptive measurement techniques (i.e., objective and self-report) are frequently used to underpin the measurement and explanation of the transactional relationships underlying the stressor to strain process (e.g. Cooper, Sloane, & Williams, 1988; Ivancevich & Matteson, 1980, 1984; Osipow & Spokane, 1983, 1987; Rizzo, House, & Lirtzman, 1970). In addition, with rare exception, descriptive measures are, it would seem, invariably used to operationalise the complex of P-E fit and transactional models of stress used in stress research (Dewe, 1991a, 1992; Dewe, et al., 1993; Payne et al., 1988).

Descriptive measurement techniques, however, are essentially unable to account for the various cognitive processes involved in the perception and personal evaluation of work-related sources of stress, the stress experience, and the effects of stress (Fineman & Payne, 1981; Lazarus, 1966; Payne et al., 1988). In particular, these techniques are unable to identify or explain the complex nature and functional involvement of personal meaning dimensions of appraisal in the stressor to strain process (Dewe, 1989; Fineman & Payne, 1981; Rizzo et al., 1970). This thesis, therefore, has sought to explore the benefits achieved from shifting the emphasis of self-report measurement from descriptive methodologies (e.g., the recognition of common stressors) to the use of appraisal centred methodologies which incorporate dimensions of personal meaning (i.e., process

of appraisal) into the measurement and explanation of occupational stress (Barone, 1995; Beehr & McGrath, 1992; Dewe, 1991a, 1992; Harris, 1995; Lehman, 1972; Lazarus, 1995; Lepore, 1995; Monroe & Kelley, 1995; Peacock & Wong, 1990; Spielberger & Reheiser, 1995; Tetrick, 1992; Vagg & Spielberger, 1998; Williams & Cooper, 1998). Accordingly, it sought to explore the hypothesis that a shift in the emphasis of self-report measurement from the recognition of common work stressors to the gestalt of the appraisal (Hobfoll, 1988; Kaplan, 1983) of common work stressors enables a significant increase in the explained variance of strain. Moreover, if seen in transactional terms, it reflects a move to the use of methodologies which emphasise the measurement of the appraised imbalance (balance) between the recognition of work stressors (i.e., actual stressors) and the personal meaning assigned to work stressors (i.e., ideal stressors) in terms of expectancy, belief, valence, or personal desirability (Beehr & McGrath, 1992; Cox, 1978, 1985b; Cox & Ferguson, 1991; Edwards & Cooper, 1988; Heider, 1958; Monroe & Kelley, 1995).

1.4 Empirical Focus of the Research

This thesis will explore a major shift in the focus of self-report measurement of the stress to strain relationship. It will move the locus of self-report measurement from the essentially quantitative (i.e., descriptive) approach to measurement used in S-O-R methodologies, to one that places an increased emphasis on a more qualitative (i.e., personal meaning) approach to the measurement of work-related stressors (Dewe, 1992; Osgood, Suci, & Tannenbaum, 1957; Narayanan, et al., 1999). That is, in comparison to the more narrow and specific focus of descriptive measurement, this shift to a more qualitative approach to self-report measurement is to one that enables a more parsimonious and holistic consideration of the demand and resource components underlying the stressor to strain process. In essence, then, the change is to one that seeks to

integrate the personal meaning assigned to common work-related stressors in terms of (a) valence, (b) expectancy and belief, and (c) the personal desirability of work-related stressors into the measurement and explanation of occupational stress.

1.5 Aim of the Thesis

This thesis will explore a transactional approach to the self-report measurement of occupational stress using alternative approaches to measurement of appraisal processes in an effort to best capture the nature of the personal meaning assigned work related sources of stress. It is hypothesised that this approach to measurement will enable a significant improvement in the explained variance of strain beyond that currently achieved by descriptive models of stress and descriptive methodologies.

1.6 Plan of the Thesis

There are two theoretical strands to this thesis: (a) an expectancy/valence strand and (b) an evaluative or personal desirability strand. Taken together, the two theoretical strands and the respective studies explore the utility of integrating a transactional view of psychosocial stress into the measurement and explanation of occupational stress.

Chapter two contains three sections which provide the theoretical underpinning of the present research. Section one outlines the theoretical perspective underlying the empirical thrust of this thesis. Section two outlines the conceptual model of appraisal and the structure of the measurement models used to explore the relationship between stressors and strain. Section three presents the rationale for the expectancy/valence and evaluative (i.e., personal desirability) strands of research.

Chapter three is comprised of three sections and presents a sequence of seven studies that sought to investigate the gains in the explained variance of strain achieved by incorporating the personal valence, expectancy and personal desirability of common work stressors into the measurement and explanation of occupational stress.

Section one provides a theoretical introduction to the expectancy/valence (i.e., personal meaning) strand of studies; and section two, a detailed description of four cross-sectional studies which explore the measurement and relative effect of (a) the expectancy and valence assigned to common work stressors, (b) expectancies for psychological strain and (c) personal beliefs associated with the provision of social support on the variance in symptoms of strain. Section three presents the findings from three cross-sectional studies (i.e., studies five to seven) which explore (a) the measurement of common work stressors in terms of personal desirability and (b) the relative effect of the personal desirability assigned to common stressors on strain related outcomes. In particular, study seven sought to (a) cross-validate the results from the six previous studies, (b) identify the model of *best fit* from the variables included in the measurement model, (c) identify the magnitude of the variance in strain explained by personal meaning appraisal processes and (d) test the principal hypothesis of the thesis.

Chapter four provides a summary and critical assessment of the gains in the explanation of the variance in strain achieved from shifting the focus of measurement from the recognition of sources of stress to the personal meaning assigned to sources of stress. In addition, it provides a critical review of the methodological problems encountered in the research programme. Recommendations for improving the measurement of common work stressors in terms of personal meaning and directions for future research are discussed.

Chapter Two

Theoretical Perspective of the Thesis
≈
The Formulation of Conceptual and Measurement Models: The Conceptual Argument and its Testing Through Measurement
≈
Rationale for Thesis

Chapter 2

2.0 Introduction

This chapter has three sections. Together they present the theoretical perspective of this empirical thesis; a critical review of the conceptual and measurement issues which affect the self-report measurement and explanation of occupational stress; the rationale for this empirical thesis.

Section one presents the theoretical perspective of this thesis. It first presents an overview of the distinctions in theoretical and methodological approaches used by stress research to explain the relationship between sources of stress and symptoms of strain. It then discusses the nature of principal methodological and conceptual issues that underlie and influence the utility, validity and limitations of self-report methodologies used in stress research. From here, it reviews the limitations of descriptive measurement as a medium to advance the understanding of occupational stress; and following this, presents a detailed description of the conceptual model used to underpin the empirical objectives of this thesis.

Section two outlines the conceptual model and structure of the measurement models used to explore the measurement and effect of personal meaning dimensions of appraisal in models of stress. It first notes the basis of polarised distinctions between traditional and contemporary formulations of occupational stress; the inherent limitations of the stimulus-response (S-R) models of stress; and the movement of stress research from mechanistic formulations of stress to *appraisal centred* formulations of stress. Next, it outlines the nature of conceptual and methodological issues which influence the

slippage between conceptual models and measurement models of stress. Following this, it then outlines the conceptual model of appraisal used to underpin the structure of the measurement models used in the series of empirical studies which explore the measurement and importance of both specific and more general cognitive style dimensions of appraisal in models of stress. It concludes with an outline of the plan for the series of studies used to explore the operationalisation of (a) sub-components of appraisal and (b) cognitive style measurement models of appraisal.

Section three, presents the rationale for the empirical objectives of this thesis. In essence, it argues that the inclusion of personal meaning appraisal processes in the measurement and explanation of occupational stress is likely to significantly improve the explanation of the transactional process underlying the stressor to strain relationship.

The rationale first states the purpose of the thesis and then outlines four aspects of stress research which effect the magnitude of the variance in strain explained by measurement models. It then reviews the importance of including personal meaning appraisal processes in the explanation of the stressor to strain process; the measurement of personal meaning; and the approaches used to personalise the nature of relationship between work demands and personal resources. From here, it then reviews the specificity of dimensions of appraisal and the relationship (i.e., cognitive overlap) of valence, expectancy, personal desirability and personality dimensions of appraisal. Following this, it then discusses the movement of measurement of the personal desirability assigned to work stressors from the arithmetic imbalance between measures of recognition and desirability cognitive processes to the output of the mental summation (i.e., gestalt) of the appraised imbalance (balance) between actual (i.e., recognition) and ideal work demands.

The rationale concludes with the presentation an outline model which depicts (a) the reciprocal relationship of recognition and appraisal processes, (b) the wider influence of personality appraisal processes on the more specific appraisal processes, and (c) the relationship of recognition, personal meaning and personality cognitive processes with job satisfaction and symptoms of personal stress. This conceptual model is used to underpin the empirical objectives of this thesis.

Section 1

Theoretical Perspective of Thesis

2.1.1 The Measurement of Occupational Stress

Two fundamental and perplexing questions may be seen to guide the theoretical and methodological approach to occupational stress. The first, refers to the issue of definition; the question, how is it best to define a work load (i.e., work-related stressor) in psychological terms (Lazarus, 1993)? The second, with the design of psychometric instruments; the question, how is it best to measure the psychological attributes (i.e., personal meaning) assigned to a work load in psychological terms (Monroe & Kelley, 1995; Smith, P., 1994)? For example, should the basis for the definition of work stressors reflect (a) the use of descriptive terms such as agreement, frequency, duration or intensity; (b) the structural characteristics of the job; (c) the nature of role-related demands associated with work; or conversely, (d) as a subjective demand in terms of either a cognitive dissonance (e.g., actual/ideal imbalance) or affective reaction (i.e., personal emotion) to the attributes of specific work stressors.

Similarly, with regard to the measurement of work stressors, should the focus of measurement be directed to capture the intensity of the cognitive response to (a) common (i.e., general description of work stressors), (b) affective (i.e., personal description of stressors in terms of valence, expectancy or value) or (c) evaluative (i.e., personal desirability of common work stressors) work stressor items using a uni-directional response scale. Conversely, should psychometric scales be designed to capture both the direction and intensity of the individual's cognitive evaluation of a stimulus item using general descriptive (e.g., factual), affective (e.g., valence, expectancy) or evaluative

(i.e., desirability) bipolar scales. Put another way, should the intensity of the cognitive response to a stimulus item be seen as embodied in (a) the semantic emphasis of the scale items (i.e., general description or alternatively, the emotional nature of the item), or (b) in the emotional nature of the bipolar anchors (i.e., frame of reference) used to evaluate the items in a scale.

It follows, therefore, that the validity of the explanation of occupational stress is fundamentally dependent on the ability of psychometric scales to meaningfully capture both the psychological presence of work stressors and the effect of the underlying transactional process on strain related outcomes. That is, the theoretical and practical utility of stress research is essentially dependent on the ability of stressor and strain psychometric scales to meaningfully explain the reciprocal nature of work stressors and the effect of the dynamic transactional process on strain related outcomes. Moreover, it also follows that any theoretical progress in the measurement and explanation of occupational stress is critically dependent on the use of psychometric scales that reflect or correspond to the nature of the constructs used to capture (a) the psychological presence (e.g., frequency, intensity or affective nature) of defined work stressors and (b) dimensions of strain.

2.1.2 Distinctions in the Context and Global Utility of Stress Research

Progress in the measurement and explanation of occupational stress, however, is also critically dependent on both the contextual emphasis of research and the subsequent contextual utility of self-report measurement. As presented in Figure 2.1.1, distinctions in the context of stress research and the contextual focus of measurement subsequently effects both the generalised utility (i.e., applied and explanatory) of stress research and thus the development of theory and method used in stress research. By contrast, Figures 2.1.1a and 2.1.2 provide a pictorial summary of the theoretical approach adopted

by this thesis to investigate the self-report measurement and explanation of work-related stressors. Together, the figures reflect the methodological and theoretical perspective underlying the aims and hypotheses tested by this research.

Figure 2.1.1 indicates that a nomothetic or context general approach to research provides the necessary basis for the development of theory and self-report measurement techniques used in stress research; Figure 2.1.1a depicts the dimensions of cognitive appraisal that capture the personal nature (i.e., transactional meaning) of work stressors; and Figure 2.1.2, the movement of self-report measurement from the description of common work stressors as the basis for the explanation of stress to self-report techniques which tap the *personalisation* or the personal meaning assigned to the attributes of work stressors. That is, it depicts the movement of measurement to one which reflects a fundamental focus on the appraisal (i.e., personal evaluation) of stressors in terms of their (a) personal valence, (b) expected effect on the individual's state of well-being, (c) personal valuation and (d) ability to predict both personal stress and job satisfaction from the evaluative information and generalise the results both within and across common contexts.

The principal distinction between the individual differences (i.e., scientific paradigm), contextual (i.e., inductive paradigm) and the idiographic (i.e., qualitative paradigm) approach to research is the inherent inability of the contextual and idiographic methodologies to generalise with any degree of confidence the results obtained from either situational specific or idiographic (i.e., self-portrait) data respectively. As Figure 2.1.1 shows, the requirement to (a) identify either situational specific or personal work stressors, (b) generate situational specific or idiographic instruments and (c) extract situational or personal interpretations of the results (i.e., use sample or case-study data as the standard for comparison) effectively restricts the utility of both contextual and

case-study research to situational application. As a result, it is difficult if not impossible to (a) validate the properties of contextual psychometric instruments and (b) perhaps the more important, guarantee the validity of the results obtained from either situational or idiographic instruments.

By contrast, the versatility and efficacy of the individual differences (i.e., nomothetic) approach to stress research resides in its ability to exploit and compare the effect of common work stressors both within and across occupational populations. Therefore, in the interests of scientific progress, it is both possible and desirable to validate, refine and standardise nomothetic instruments used in stress research. In other words, the law of parsimony (i.e., in basic terms, the reduction of complex phenomena into common elements as the basis for universal explanation) can be seen to underpin the basis for the universality of theory, measurement and explanation in context general research (Barratt, 1971). Furthermore, as the figure shows, it is also possible to personalise or supplement nomothetic measures of common work stressors by the inclusion of nomothetic measures which consider the valence, expectancy, and personal desirability assigned to common work stressors in models of stress. Moreover, from this evaluative information, it is possible to extract measures of both personal demand and optimal demand (Payne, 1979a) which may then be used to explain the psychological and physiological well-being of individuals.

Figure 2.1.1 provides also some insight into the nature and effects of the principal characteristics underlying the explanatory utility and empirical limitations associated with nomothetic, contextual and idiographic methodologies. As shown in the figure, the principal characteristics underlying the nature and efficacy of the three approaches

to research essentially fall on discrete continuums that embrace the issues of (a) *generalisation*, (b) *focus of measurement*, (c) *conceptual understanding* and (d) the *variance explained* by the conceptual model.

Briefly, the issue of generalisation reflects the decreasing utility of quantitative data across the domains of research, that is, it embodies the transition from the universality of empirical data to an absolute focus on the utility and specificity of contextual and idiographic data. The figure reflects also the movement of measurement from the domain of quantitative universality (i.e., standardisation) to an essential emphasis on the merits of qualitative generalisation as the basis for the measurement and explanation of occupational stress. Put another way, the figure in essence reveals (a) the reciprocal nature, (b) specialised utility and (c) functional overlap of the nomothetic, contextual and idiographic domains of research. On the one hand, the basis for the measurement and explanation of individual differences can be seen as embodied in the scientific principles of parsimony, generalisation, replication and revision. On the other, rests the rejection, revision and formulation of theoretical concepts and methodologies derived from the qualitative generalisation (i.e., informed feedback) of qualitative results obtained from contextual and idiographic research. The rejection of the idiographic and context specific approaches to research, however, does not deny that they have both applied and theoretical utility in the progress of stress research. Indeed, it is logical to assume that nomothetic measures of common or general stressors will likely reflect the qualitative generalisation of both context specific and individual specific work stressors. However, although contextual and idiographic measures may enable a more complete understanding of the nature and effects of work stressors, the progress of stress research is most essentially dependent on the application and contextual utility of general measurement techniques.

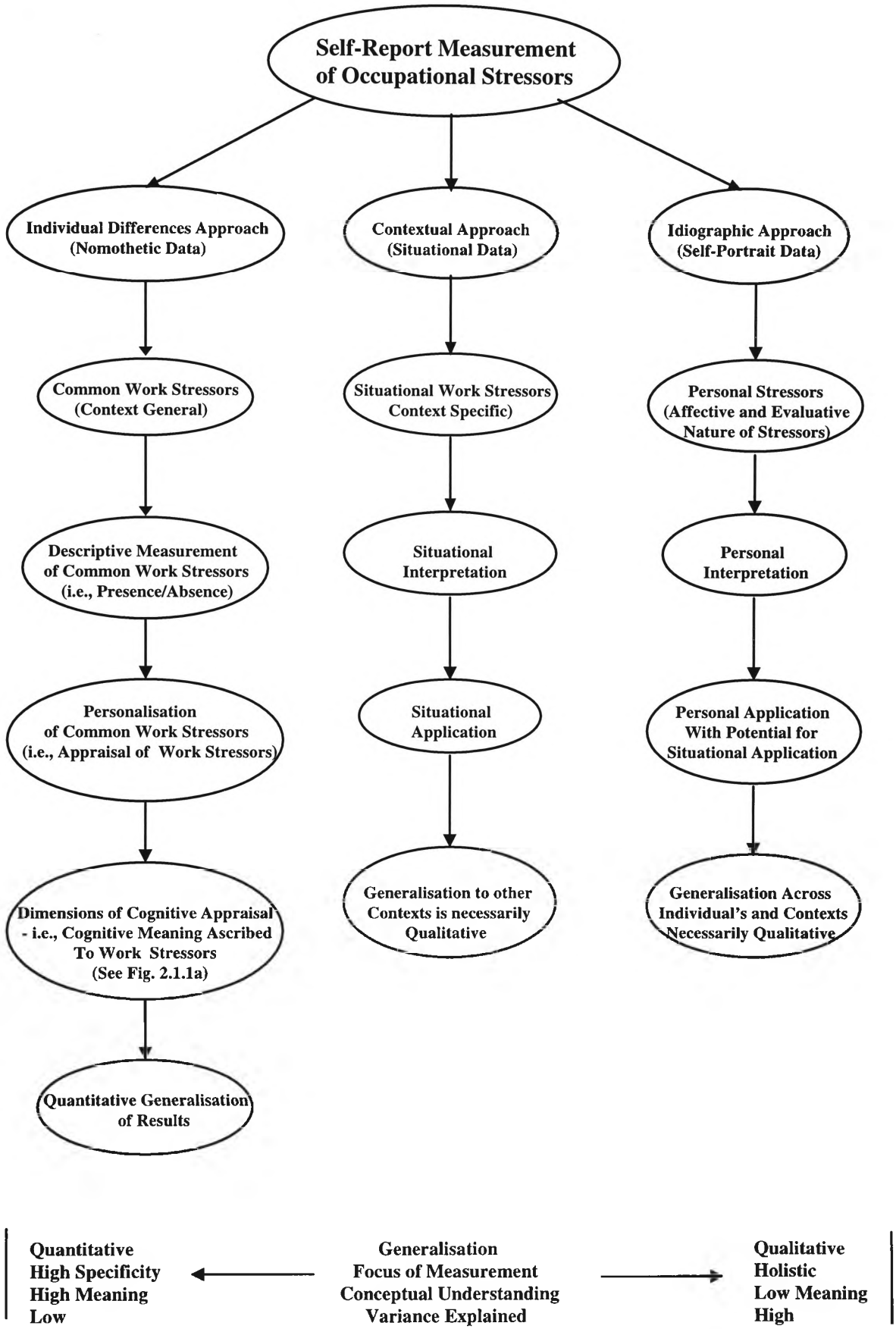


Figure 2.1.1 Three Broad Theoretical and Methodological Approaches to Understanding the Validity of Descriptive and Personalised Occupational Stressor Self-Report Measurement

With respect to the focus of measurement, both within and across the domains of measurement, the issue, then, is essentially one of parsimony. That is, should the focus of measurement be specific to either the context or the individual; or conversely, should the frame of reference for measurement be encapsulated in nomothetic (i.e., context general) concepts. Thus, the perplexing question for stress research, should the basis for the measurement and explanation of stress emphasise the use of (a) multiple constructs (i.e. narrow or discrete cognitive dimensions), (b) holistic or composite constructs (i.e., broad cognitive frames of reference), (c) nomothetic, contextual or idiographic methodologies. As the figure shows, the nomothetic approach to research is in essence fundamentally dependent on the use of context general instruments and the power and probability of statistical inference. In other words, the generalisation of results is by necessity fundamentally dependent on the size, specificity and randomness of the representative sample. By contrast, the contextual domain is most essentially concerned with the unique nature or statistical description of a specific sample; and the idiographic approach, on the holistic nature or unique qualities of a specific individual.

Similarly, within the nomothetic domain of measurement (see Figure 2.1.1a) the nature and focus of measurement can be either highly specific (i.e., employ narrow or specific dimensions of appraisal) or alternatively, more general or holistic in its nature and focus. That is, it may emphasise the use of more specific descriptive and/or personalised (e.g., valence, expectancy or belief) measures of appraisal; or alternatively, employ either specific or more general items as the basis for measurement and explanation. Alternatively, it is possible to collapse either theoretically or statistically both descriptive and appraisal dimensions of measurement into either composite (i.e., unidimensional) or more holistic (e.g., personal desirability or personality) dimensions of measurement.

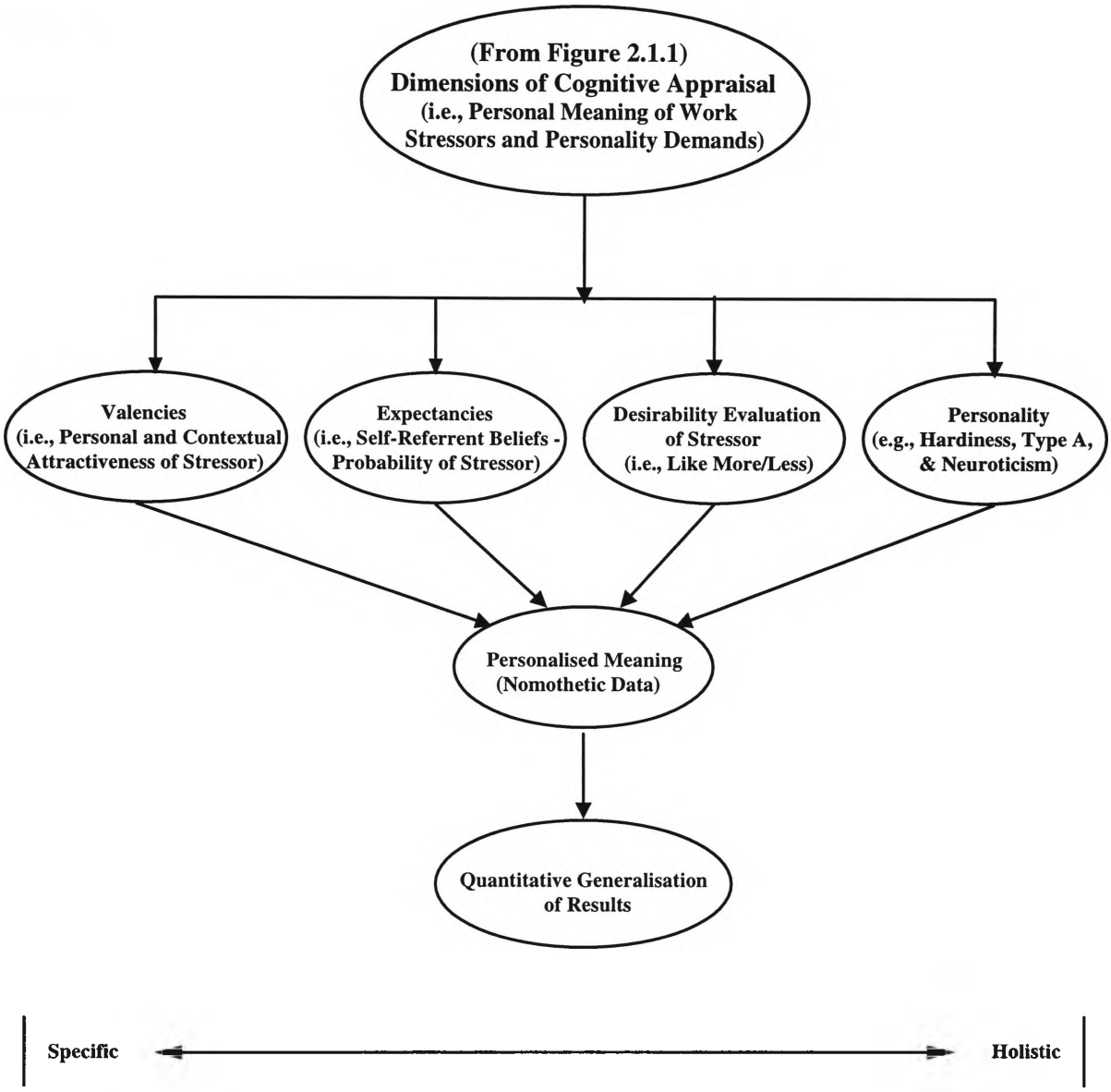


Figure 2.1.1a Measurement Dimensions of Cognitive Appraisal - The Transactional Meaning of Common Work Stressors in Terms of Valence, Expectancy, Desirability Evaluation and Personality Cognitive Styles

The nature and focus of measurement, therefore, can be seen as essentially specific or directly related to the concept of interest. As a result, the frame of reference used to measure a stressor concept (e.g., stressor valence or stressor expectancy) may either be wide (i.e., reflect the use of a common dimension and general items); or conversely, the concept may be broken down into more narrow or discrete sub-scales and more specific

items in an attempt to gain a more complete measure of the psychological meaning assigned to stressor demands. For example, evaluative dimensions of measurement may be seen as essentially holistic in nature as they are thought to capture the fusion of the underlying cognitive (i.e., descriptions) and lower-order appraisal (i.e., valence and expectancy) dimensions of cognition. Similarly, measures of personality constructs (e.g., hardiness) may utilise either broad or narrow frames of reference to tap the psychological nature of the personality construct. Furthermore, measures of personality cognitive styles (i.e., individual differences) may be seen as essentially holistic in nature as the emphasis of measurement is concerned with the unique nature or subjectivity of the individual in the global context. That is, measures of personality cognitive styles may be seen to reflect the individual's appraisal of an imbalance or dissonance between either extrinsic or intrinsic sources of demand (i.e., personal resources and work-related demands) and intrinsic frames of reference such as ideal self-image, needs and desires, and personal motives. For example, the measure of hardiness seeks to identify the personal attributes or resilience of the individual in terms of personal control, commitment to the organisation and their desire to challenge the imposing environment.

The issue of conceptual understanding is in essence embodied in the degree of specificity utilised for the measurement and subsequent explanation of the stress phenomenon. Put another way, this issue is fundamentally concerned with the practical utility and the explanatory utility of psychometric scales. That is, it refers to (a) the portability or generalised utility of scales across contexts and (b) the extent or degree to which either a battery of scales of measurement or conversely, a single scale, is able to provide a comprehensive understanding of the stress phenomenon. For example, descriptive stressor scales invariably account for only a moderate percentage of the variance in strain. Such scales, however, have limited utility as they are not able to provide any

substantive insight or understanding of the underlying appraisal processes that personalise the nature and effects of a particular work stressor. Similarly, the relative effect of dispositional measures such as hardiness may in and by themselves explain a substantial proportion of the variance in strain. However, when seen in terms of conceptual understanding, they offer limited insight to the nature of stressors that are mediated by the dispositional attribute. Hence, out of necessity, there is imposed on stress research the need to utilise a complex of descriptive constructs in measurement models in an effort to explain the nature and effects of occupational stress. Alternatively, an equally constructive and sensible approach to the issue of conceptual understanding (i.e., the utility of methodology), is to unpack the nature and effect of the appraisal process underlying the relationship between stressors and strain related outcomes.

Finally, the issue of explained variance may be seen as essentially an extension or outcome of the measurement and utility issues. Specifically, the impetus of research is invariably driven by the demand to account for additional variance in strain related outcomes. For example, because of its situational and more holistic focus, the contextual approach to research is likely to account for a greater percentage of the variance in a dependent measure in comparison to that explained by standardised (i.e., nomothetic) instruments used in the same situation. Likewise, the idiographic approach because of its individualistic or essentially holistic focus may often provide a more complete understanding of the factors that impact the behaviour and subsequent well-being of the individual in a particular context. However, when such results are subjected to the scrutiny and rigour of scientific principles (i.e., the laws of universal order and regularity) they are not able to uphold their implied reliability and validity. Therefore, it may be argued that any explanation of variance in a dependent measure that is not enshrined in the rigour of scientific methodology should be seen as both dubitable and distractable knowl-

edge. For example, as indicated in Figure 2.1.1, the variance explained by specific or discrete scales is invariably low. However, as the scales adopt a more holistic focus, they would be expected to account for more of the variance in a dependent variable. Thus, the apparent paradox and dilemma facing stress research: is there more advantage to be gained from using holistic instruments at the expense of substantive understanding; or alternatively, is the quest and progress of science perhaps better served by placing the focus on the understanding of the stress complex at the expense of explaining more of the variance in strain related outcomes.

Similarly, and although not shown in the figure, it is also possible to design context specific instruments that measure the personal nature of situational stressors. However, due to the situational emphasis of such scales, there is in effect no valid basis by which to generalise with any degree of confidence, the significance of the quantitative information to the universal context. As a consequence, other than applied application in specific situations, the use of quantitative data obtained by situational specific psychometric instruments can be seen to have limited usefulness in (a) the measurement and explanation of occupational stress in the global context, (b) the refinement of theory and method used for stress research, and (c) the development of self-report instruments to measure the effects of work-related demands.

2.1.3 Theoretical Model of Occupational Stress

Figure 2.1.2 provides an introduction to the reciprocal nature of the theoretical perspective underlying the direction of research and the findings reported in this thesis. Theoretically, the issue of measurement is in effect one of parsimony and validity (Barratt, 1971). The question for research: Can the transactional process underlying the relationship between common work stressors and strain be adequately explained using descriptive information that is more than likely blurred or biased by the underlying effect of

appraisal processes linked to the attributes of common work stressors (Glowinkowski & Cooper, 1987). The perplexing question, therefore, is it possible to explain additional variance in symptoms of strain by increasing the sampling specificity and response variability of descriptive scales, that is, by increasing the variability of the scale by the use of additional items in the scale. Alternatively, is it feasible to adequately explain the effect of work stressors using a more parsimonious approach to measurement by developing scales which reflect a more general focus on the nature and effect of work stressors. That is, by using reductionist techniques which reduce either the number of scalar dimensions representing the nature of common work stressors or the number of items used in a scale.

Conversely, a perhaps necessary and more desirable alternative is to systematically *unpack* the cognitive structure of the process of appraisal into its discrete descriptive (i.e., quantity) and evaluative sub-components as the conceptual basis for the measurement and explanation of stressor to strain relationship (James & James, 1989; Locke, 1969). As Payne et al. (1988) argue, current descriptive methodologies are invariably only able to account for a relatively modest amount of the variance in symptoms of strain and therefore may be seen as somewhat limited in their ability to provide a valid explanation for the transactional process underlying the effect of work stressors. In other words, descriptive self-report measures of common work stressors essentially neglect the importance of the contextual meaning (i.e., the personal meaning assigned to the attributes of a specific context) assigned to work stressors in the stressor to strain process. Indeed, this failure to include the personal (i.e., idiographic) aspects of the process of appraisal in the measurement of common work stressors may in effect account for the poor explanatory validity of current occupational stress inventories.

The present research, therefore, has sought to investigate this deficiency in the measurement of common work stressors by exploring the efficacy of specific and more general dimensions of appraisal to explain additional variance in strain. In short, it sought to (a) sequentially unpack the process of appraisal underlying the perception (i.e., recognition) of common work stressors and (b) identify the extent to which valence, expectancy, belief, desirability and cognitive style dimensions of appraisal contribute useful information to the explained variance in symptoms of strain.

Theoretically, the basis for the thrust of the expectancy/valence and evaluative (i.e., desirability) strands of research is based on the following aspects of cognitive processing used in the perception and evaluation of work stressors. Namely, those involving: (a) the multicomponent view on the structure of attitudes (i.e., cognition, affect and behaviour); (b) the relative independence and the fusion of expectancies (i.e., beliefs) and valencies (i.e., attitudes) in the perception of objects and events; (c) the relative importance or cognitive imbalance between expectancy/valence dimensions of appraisal and social influence (i.e., normative beliefs) in cognitive outcomes; (d) the individual's use of evaluative, potency and activity bipolar adjectives (i.e., semantic differentials) to impute meaning (i.e., direction and intensity) to the properties of stimulus words and concepts; and (e) the reciprocal or subjective nature of evaluative cognitive processes (Ajzen & Fishbein, 1980; Arnold & Gasson, 1968; Bandura, 1986; Benner, 1984; Cohen, Kessler & Gordon, 1995; Cox, 1978; Feather, 1992; Fishbein & Ajzen, 1975; Gowler & Legge, 1980; Lazarus, 1993; Osgood et al., 1957; Vroom, 1964).

Therefore, given the cognitive nature of the conceptual model, the theoretical basis for the development of measurement may be seen as located within an attitudinal or cognitive schema framework; and the basis for self-report measurement, within an

evaluative framework that emphasises the attribution of meaning to objects and events. The theoretical basis for the measurement and explanation of stress, therefore, is in effect transactional in nature as the focus of theory and method is explicitly concerned with the nature of the personal meaning assigned to common work stressors and the reciprocal relationship (i.e., imbalance between actual demands and ideal demands) between the description and personal evaluation of work stressors (Barone, 1995; Cohen et al., 1995; Cox, 1978; Harris, 1995; Kilpatrick, 1961; Lazarus, 1993, 1995; Lazarus & Folkman, 1984). Therefore, when seen in operational terms, the measurement model is in essence concerned with (a) the measurement of the personal meaning assigned to work stressors; (b) the relative effect of personal meaning dimensions of appraisal on the variance in strain when in the presence of common (i.e., descriptive) stressors; and (c) the nature and effect of the appraised imbalance between the presence of common stressors (i.e., actual) and the cognitive evaluation of common work stressors (i.e., ideal stressors) on personal stress and job satisfaction (Caplan, 1983; Cox, 1978; Cox & Ferguson, 1991; Payne et al., 1988; Pervin, 1968; Sharit et al., 1998; Siegrist & Peter, 1994; Smith, Hartley & Stewart, 1978).

The fusion and reciprocal nature of the descriptive and evaluative components of the process of appraisal underlying the perception and personal interpretation of common work stressors is depicted in Figure 2.1.2. The inherent limitation of the descriptive approach to measurement and explanation is evidenced by its failure to involve the evaluative nature of the higher order valuative components of information processing in models of stress (James & James, 1989; James & Jones, 1980; Payne et al., 1988; Tetrick, 1992). In other words, descriptive measurement is both unable and does not explicitly account for the personal meaning assigned to common stressors or the nature of the emotions (Barone, 1995; Harris, 1995; Lazarus, 1993, 1995) associated with

common work stressors. However, it is both feasible and sensible to unpack the complexity of this hypothetical cognitive structure into its independent components and identify the relative ability of the discrete components to contribute significant information to the explanation of the variance in symptoms of strain.

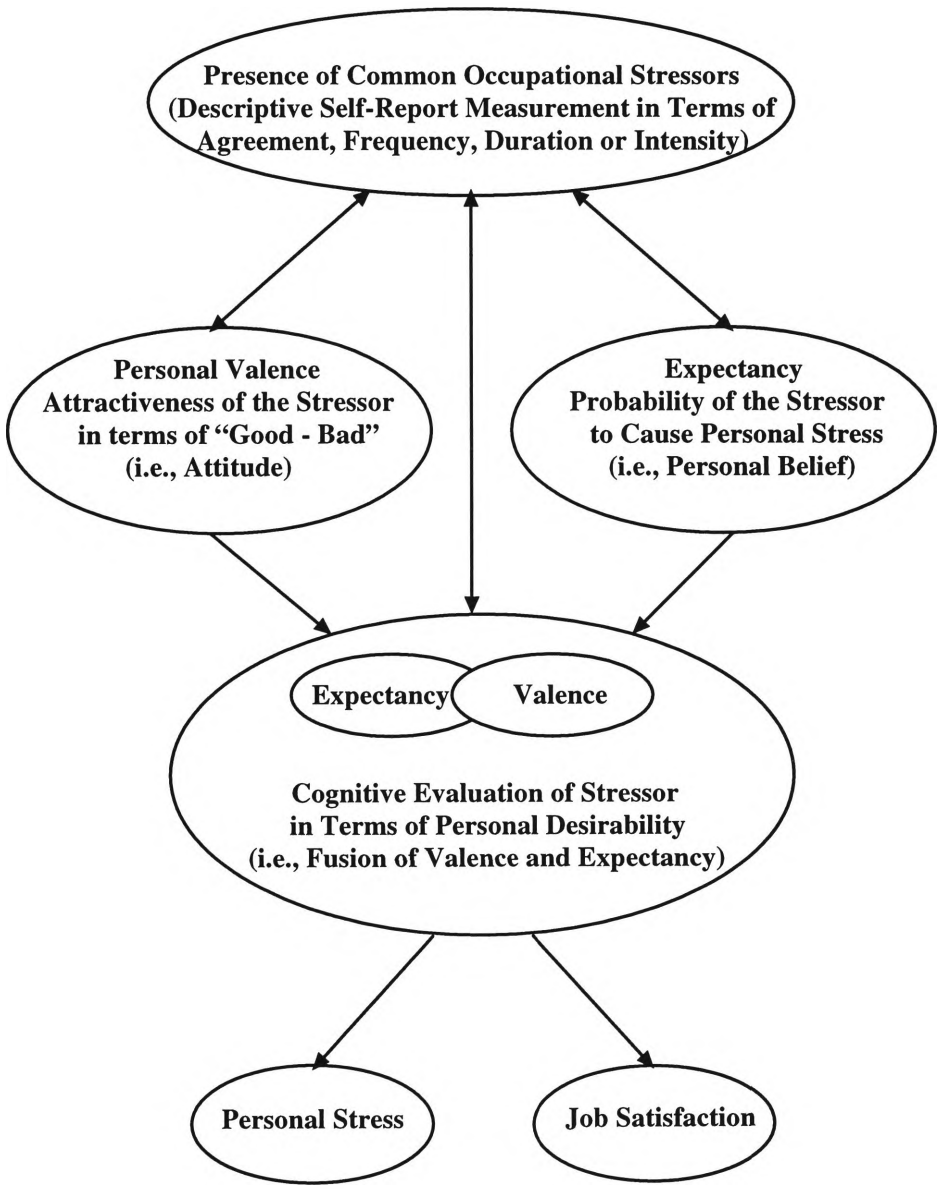


Figure 2.1.2 The Functional Relationship of Recognition, Valence, Expectancy and Evaluative Occupational Stressors and Personal Well-Being - The Personalisation of Common Work Stressors in terms of Valence, Expectancy and Desirability Evaluation

With regard to the personal valence (i.e., attitude to the stressor) assigned to work stressors, the underlying assumption is that the attributes of the stressor is evaluated with respect to the positive or negative attractiveness of the stressor. That is, the nature of the stressor is evaluated in the terms of *how good* or *how bad* the stressor is in relation to the needs and values of the person (Ajzen & Fishbein, 1980; Jurgensen, 1978). For example, the role-overload item "Job demands which exceed my personal and company resources are" in response to the bipolar anchors "good-bad" illustrates the personal emphasis of a stressor valence item. Furthermore, both the emphasis of the item and the individual's response to the item is presumed to be self-referrent (i.e., subjective) in nature, As a result, the direction and intensity of the individual's response to the item is assumed to reflect the nature of the personal meaning assigned to the stressor in the context. However, it may well be the case that the personal meaning assigned to a common work stressor is potentially influenced by either contextual or *social norms* (i.e., *shared beliefs*) peculiar to the stressor item (Ajzen & Fishbein, 1980; Clarke, 1998; Hulin & Blood, 1968; Kirkcaldy & Cooper, 1992; Lazarus, 1995; Lundberg, 1988; Schabracq & Cooper, 1998; Schriber & Gutek; 1987; Smith, M., 1994; Steers & Porter, 1991, p. 196; Williams & Clarke, 1997). Put another way, it is possible that the response to a valence item reflects either the self-referrent meaning of the stressor; or conversely, the contextual or social valency assigned to the attributes of the valence item.

It is possible, therefore, that the valency of stressor attributes varies across populations and equally probable, reflect the underlying reinforcement of the social norm for the attributes of the stressor item. Consequently, it may be the case that the effect of common work stressors changes the direction and the intensity of attitude valence by context. For example, responsibility at work is likely seen as a valued and desired

attribute by society in general. However, in the context of work, it is possible that the valence of responsibility may be seen as highly positive in one context and highly negative in another due to either the nature of the work or the skills and ambitions of the sample. As a result, the role of responsibility may be seen as a source of stress or an undesirable facet of work in one context, yet in another, as a valued aspect of work. As such, it would be expected that the variability in the response to the common stressor item would reflect the intensity of the contextual valency of the item. That is, if seen as self-referrent in the context (i.e., reflect individual differences in personal meaning), the response to the stressor would be expected to reflect a normal distribution; or conversely, if seen as a contextual norm, tend to converge toward either of the bipolar anchors. Furthermore, if taken a step further, any convergence on the negative pole of a bipolar response scale may provide an insight to sources of stress in the work context. Thus, the perplexing challenge for measurement, the necessity to *tease out* or distinguish the subtleties between the personal and normative valence of common work stressors.

With respect to the effect of expectancies (i.e., self-referrent beliefs concerning the probable or anticipated effect of common work stressors) associated with work stressors, the underlying assumption is that individual's acquire from the nature of their unique transactional experiences, relatively stable cognitive schemas concerning the probable effect of work stressors on the person's ambitions or state of well-being (Dewe & Brook, 1997; Feather, 1992; Fishbein & Ajzen, 1975; Greenhaus, Seidel, & Marinis, 1983; Kelly, 1955; Nystedt & Magnusson, 1982; Pennebaker & Watson, 1988; Smith, et al., 1978; Tetrick, 1992; Zajonc, 1980). For example, the role-overload item "Job demands exceeding my personal and company resources will cause me stress" and the bipolar anchors "likely-unlikely" illustrates the personal emphasis of the expectancy

items. Accordingly, the nature of the personal meaning ascribed to an expectancy item may be seen as embodied in the personal emphasis and probability of the "likely-unlikely" bipolar anchors. Furthermore, the personal emphasis of the scale may be seen as similar to the concept of *threat* used by Lazarus and Folkman (1984) to underpin the process of primary appraisal (i.e., transactional nature) and the subsequent process of adjustment (i.e., secondary appraisal) to the appraisal of personal demands.

However, similar to valencies, it may also be the case that expectancies about the possible effect of a common work stressor are, to a large extent (a) context specific, (b) influenced by the persons beliefs about the expectations of significant others, (c) moderated in the context by personal experience and dispositional factors and (d) to some extent shared beliefs (i.e., cultural norms) which originate from the effects of socialisation (Ajzen & Fishbein, 1980; Cox, 1991; Cox & Howarth, 1990; Feather, 1996; Lundberg, 1988; Schabracq & Cooper, 1998; Schriber & Gutek, 1987). For example, socialised beliefs (i.e., cultural norms) about the nature of work, may view responsibility as a valued or desirable facet of work (Lundberg, 1988). In the work context, however, it is possible that the effect of either (a) collective or shared beliefs concerning the negative nature of responsibility; (b) adverse personal experience with responsibility; (c) limitations in the person's skills and abilities; or (d) the person's perception of social or authoritative pressure to accept responsibility at work may in effect cause the person to feel stress. Expectancies, therefore, may be seen as essentially subjective in nature and imply that individual's acquire from the interdependent effects of (a) socialisation, (b) personal experience, (c) dispositional characteristics and (d) social pressure a relatively stable cognitive schema of self-referrent expectancies concerning the nature of the context. Therefore, as expectancies have self-relevance, it would be expected that the variability in the response to common work stressors will reflect a wide vari-

ability due to the underlying effect of individual differences (e.g., belief schemas for control, hardiness or self-efficacy) on the response to the stressor items (Bandura, 1977; Bohle, 1997; Dewe & Brook, 1997; Kobasa, 1979; Rotter, 1966; Sharit et al., 1998).

By contrast, the emotional or personalised evaluation of a stressor can be seen as embodied in the fusion or functional overlap of the valence and expectancy components of appraisal (Ajzen & Fishbein, 1980; Feather, 1992) when assessed in terms of "Would like more" "About right for me" or "Would like less" of the stressor in the individual's current sphere of work (Arnold, 1967; Locke, 1969; Zajonc, 1980). For example, the role-overload question: "Resources at university - e.g., library, computers etc." in response to the differential or tripolar anchors "Would like more" "About right for me" "Would like less" reflects the neutral or non-emotional nature of the items and the emotional emphasis embodied in the semantics of the differential anchors (Clarke, 1998; DeFrank, 1988; Lepore, 1995; Monroe & Kelley, 1995). The emotional emphasis of the response scale (i.e., frame of reference for the neutral item) is in effect concerned with the individual's personal desire for more or less of the common work stressor in their work context. Put another way, it can be argued that the evaluative scale is in effect a measure of personal underload, overload or optimal demand with respect to their degree of desire for common work stressors (Payne, 1979a; Schabracq & Cooper, 1998). As such, the evaluative scale enables the relative distinction between excessive and reasonable work demands and from this information, the prediction of strain related outcomes or job satisfaction. Specifically, discrete response scores on the evaluative scale greater than +1 or -1 can be inferred to represent excessive demand for the individual; and scores between +1 and -1 as indicative of satisfaction with the demands and opportunities associated with the work stressor (Caplan, 1983; Payne,1979a; Pervin, 1968). Furthermore, if taken a step further, however, it can also be argued that the scale

is in effect a measure of the individual's *psychological fit* in their work context, that is, a measure of their personal fit in the prevailing culture of the context (Cooper & Payne, 1992; Schabracq & Cooper, 1998).

2.1.4 Summary

In summary, the research has sought to demonstrate that the integration of the contextual meaning of common work stressors into the measurement and explanation of occupational stress enables a significant increase in the explained variance of strain. The research is in effect concerned with the issues of theoretical utility, practical utility, and predictive validity. Respectively, therefore, it is concerned with the extent to which affective and evaluative stressor dimensions of measurement (a) improve the understanding of occupational stress; (b) have global or context general utility; and (c) are able to account for variance beyond that explained by the more traditional descriptive approach to the measurement and explanation of occupational stress.

Section 2

The Formulation of Conceptual and Measurement Models: The Conceptual Argument and its Testing Through Measurement

2.2.1 Introduction

Polarised assumptions and principles embedded in the empiricist and rationalist views on the approach to science may be seen to underpin the conceptual formulations and measurement models used to both investigate and explain the nature and effects of occupational stress (Aldwin, 1994; Barone, 1995; Barratt, 1971; Dewe, 1992; McGartland & Polgar, 1994; Morey & Luthans, 1984; Rand, 1964). For example, the empiricists would argue that an objective or stimulus-response (S-R) formulation of stress provides the more valid explanation of stressor to strain relationships (Kasl, 1998). Those adopting a rationalism or stimulus-organism-response (S-O-R) view of stress, however, would argue that an S-R approach to stress research only provides a somewhat simplistic and restricted understanding of the stressor to strain process. In essence, then, their argument asserts that to acquire a more valid or complete understanding of the stress phenomenon, it is necessary to include the mediating (i.e., intervening) role of psychological processes in both conceptual and measurement models of stress (French & Kahn, 1962; Lazarus, 1990).

Although heuristic in their own right, however, the slippage between S-O-R conceptual model of stress and methodological practice is consistently evident in stress research (Aldwin, 1994; Dewe, 1989, 1991b, 1992; Lazarus, 1995). As a result, there is the inference that the translation (i.e., operationalisation) of contemporary definitions of

stress (e.g., transactional models) and the associated constructs (e.g., process of appraisal) into methodological practice is either more difficult and/or contentious than the exactness of the definitions imply. As a consequence, there is invariably a reversion to what is essentially an S-R approach (Dewe, 1991b) to the measurement and explanation of occupational stress (e.g., Osipow & Spokane, 1983, 1987). This thesis, however, has sought to demonstrate that it is indeed possible to translate the central role of appraisal processes in transactional models of occupational stress into methodological practice. That is, it sought to explore the measurement and relative importance of the personal meaning (i.e., in terms of expectancy, valence, personal belief and personal desirability), assigned to work related sources of stress in stressor to strain relationships.

2.2.2 Traditional and Contemporary Models of Stress

Given the objective emphasis of the more traditional S-R formulations of stress (Aldwin, 1994), the assumptions of determinism (i.e., order and regularity) and generality (i.e., classification in terms general concepts, properties and laws), and the principle of observation (i.e., objectivity) may be seen to underpin the conceptual basis of S-R models and measurement of occupational stress (Aldwin, 1994; Barratt, 1971; Cox, 1978; Dewe, 1992; Kasl, 1998; Lazarus, 1993; McGartland & Polgar, 1994; Payne, 1982). In essence, then, this conception of stress embodies an approach to the measurement and explanation of stress which reflects the demand of *empiricism* for an essentially objective (i.e., descriptive) and systematic (i.e., regular) approach to science. Thus, in more explicit terms, the S-R formulation of stress may be seen to reflect an empirical philosophy which explicitly rejects both the importance and functional role of cognitive processes (i.e., individual differences) in the nature and explanation of stressor to strain relationships (Landy, 1982; Karasek et al., 1998, Kasl, 1998; Lazarus,

1993). S-R models of stress, therefore, may be seen to offer an essentially nomothetic (i.e., universal) and normative (i.e., commonality in the stimulus effect) approach to stress research (e.g., Karasek et al., 1998). Furthermore, these formulations of stress may be seen to represent a cause and effect or unidirectional approach to the origins and effects of stress that is operationalised using either objective or quasi objective (e.g., descriptive self-report) methodologies (Freze & Zapf, 1988). That is, such models in effect reject the role of feedback (i.e., reciprocity) in S-R interactions (Lazarus, 1995; Tetrick, 1992); moreover, they represent an essentially descriptive approach to the measurement and explanation of stress which is driven by the principals of objectivity, parsimony and classification (Barratt, 1971). Thus, by way of summary, S-R formulations of stress may be seen as those which seek to identify and explain the regularity of cause and effect occurrences (i.e., phenomena such as stressor to strain relationships) from the commonality of the linkage between stimulus and response (Kasl, 1998).

In the stress domain, for example, the classification of normative (i.e., common) stressors and their causal linkage with symptoms of strain may be seen to epitomise the general and enduring focus of stress research (Cooper et al., 1988; Dewe, 1991a, 1991b, 1992; Lazarus, 1995; Osipow & Spokane, 1983, 1987; Rizzo et al., 1970). Essentially, then, there is employed a conceptual and methodological approach to stress that seeks to examine and find support for the hypothesis that the objective nature of a normative stressor (i.e., the magnitude of the stressor in terms of agreement, frequency, duration or intensity) has a common and consistent effect on symptoms of strain (Dewe, 1991a; Osipow & Spokane, 1983, 1987; Payne et al., 1988; Tetrick, 1992). For instance, high work demands are hypothesised to correspond to high levels of stress (strain), that is, the magnitude of the resultant response is seen as embedded in the properties of the

stimulus. Moreover, this resultant bond between S and R is deemed to be independent of any spurious influence from either the mediating or moderating effects of psychological factors such as personality, intelligence, cognitive appraisal (i.e., personal meaning) or coping (i.e., adjustment) processes (Cox & Ferguson, 1991; Dewe, 1991b; Payne, 1991). S-R formulations of stress, therefore, may be categorised as those which seek to classify and replicate in both normative and generalised (i.e., common) terms, the consistency of the correspondence between S and R (McGartland & Polgar, 1994; Payne, 1982).

However, in contrast to the mechanistic nature of empiricism (Payne, 1978, 1982), the *rationalism* (i.e., subjective) view of science may be seen as embodied in the essence of the supposition that the process of . . . "reason contribute(s) to the acquisition of knowledge" (Barratt, 1971, p. 38). Therefore, to further explore these dichotomised views of science, it is worthwhile to cite Barratt's distinction of the empiricism and rationalism views of science. As Barratt argues:

> One end of the scale (rationalism) emphasizes the inner aspect and concerns itself with the mind (or soul) and its thoughts, feelings and strivings which constitute the inner "self"; the other (empiricism) has external reference and concerns itself with the forces of the environment as they instigate and shape behaviour. The one is a personalistic approach, while the other is naturalistic (p.38).

Accordingly, there is embodied in the principles of rationalism, the basis for personalised or S-O-R formulations of stress; in essence, the movement of conceptual models to those which recognise the importance of psychological factors (i.e., individual differences) and the reciprocal nature of person-environment interactions (i.e., role of intervening cognitive processes and response feedback) in stressor to strain outcomes.

For example, the transactionist approach to stress may be seen to have its origin or theoretical underpinning in the rationalism view of science (Barone, 1995; Dewey & Bentley, 1949; Harris, 1995; Kilpatrick, 1961; Lazarus, 1995; Payne, 1978; Pervin, 1968). Transactionism, therefore, may be seen as a contemporary view of stress which rejects objectivity as the conceptual basis for measurement and explanation; a conception of stress which in effect shifts the emphasis of understanding to the reciprocal and dynamic nature of person-environment transactions and the functional importance of intervening cognitive processes (e.g., judgement and adjustment appraisal processes) in the S-R relationship (Barone, 1995; Benner, 1984, Cox, 1978; Dewe, 1991b; Harris, 1995; Lazarus, 1967, 1995; Lazarus & Folkman, 1987, Payne, 1882, 1991; Segovis, Bhagat, & Coelho, 1985; Tetrick, 1992). As Dewe (1992) further points out, the basis of understanding is effectively moved from an essential emphasis on the objective properties of the stimulus to the personal . . . "significance of the event (i.e., what's at stake for the individual) and its meaning" to the individual (p.96). Cognitive appraisal, therefore, may be seen as a process which imbues personal meaning to the nature of (a) situational encounters and (b) personal states; it is a cognitive construct which is hypothesised to reflect the reciprocal and dynamic nature of person-environment transactions (Arnold, 1960, Lazarus & Folkman, 1984; Monroe & Kelley, 1995; Shirom, 1982).

2.2.3 Conceptual and Methodological Issues

There are, however, a number of conceptual and measurement issues which may be seen to effect (a) the operationalisation of S-O-R conceptual models; and (b) the magnitude of the variance in strain explained by measurement models. In each case, the

underlying issue is in effect one of slippage between theory and measurement: in operational terms, how well does measurement reflect the underlying conceptual model (Smith, M., 1994).

The process of cognitive appraisal may be hypothesised as a number of appraisal dimensions. For example, dimensions of appraisal such as valence, expectancy, belief and desirability may be seen to function as intervening appraisal processes in the transactional relationship between the person and their environment. Three fundamental methodological problems, however, arise from the multidimensional nature and functional role of appraisal in the stressor to strain process (Ajzen & Fishbein, 1980; Monroe & Kelley, 1995). First, there is the issue of measurement; that is, how is it best to operationalise and validate appraisal constructs? The second, with the issue of parsimony; what is the more valid method to combine dimensions of appraisal into higher order cognitive constructs? For instance, is it valid to use additive or multiplicative arithmetic techniques to form higher order levels of appraisal; or alternatively, is it more valid to use correlational techniques as the basis by which to form theoretical constructs? The third, is concerned with the hypothetical nature of appraisals; that is, should the nature of the cognitive evaluative process be seen as reflecting a continuum of responses to stimulus items or alternatively, as a categorical response to a stimulus item?

In addition, cognitive appraisal can be hypothesised as reflecting a general cognitive style (Antonovsky, 1991; Cox & Ferguson, 1991; Kobasa, 1982; Payne, 1988a, 1991). Therefore, it may be seen as a dispositional characteristic or higher order level of appraisal which embodies the totality of the appraisal process. The resultant problem that arises, however, is how is it best to characterise this more general cognitive style. For example, the dispositional constructs neuroticism, hardiness Type A and locus of con-

trol are hypothesised to represent cognitive styles which reflect the nature and efficacy of individual differences underlying cognitive, psychological and behavioural outcomes (Schaubroeck & Ganster, 1991).

The complexity and dynamic nature of the transactional model of stress further reflect in the comprehensiveness of measurement models employed to operationalise transactional models of stress. Stress (strain) is a transactional process which is seen to involve a number of cognitive processes other than cognitive appraisal. Therefore, a more complete measurement model needs to include at least some of these interactive cognitive processes in the model if there is to be achieved a more substantive understanding of the transactional process underlying stressor to strain outcomes. For example, coping appraisal processes (Lazarus, 1995, Lazarus & Folkman, 1984) intelligence or cognitive abilities (Payne, 1991; Smith, M., 1994) and socialisation cognitive processes (Ajzen & Fishbein, 1980) are hypothesised to underlie the nature and resolve of person-environment transactions.

Furthermore, occupational stressors are but one potential source of stress. Sources of work related stress are in effect multiple in nature and may originate from either intrinsic or extrinsic sources of demand (Payne; 1979a; Selye, 1980; Schabracq & Cooper, 1998; Smith et al., 1993). For example, work-role demands and physical work conditions may be seen as organisational or contextual sources of stress; demands for social support as a social source of stress and the self-evaluation of personal demands such as needs and status of well-being as intrinsic sources of stress. Therefore, when related to the variance in occupational stress, any model which is restricted to occupational stressors would not be expected to explain 100% of the variance in strain (Hobfoll, 1988; Webster & Starbuck, 1988). Further, the magnitude of the variance in strain explained by the model may in effect obscure the relative importance of significant predictors in

the model. When the variance explained by a model is expressed in relative or proportional terms, the relative effect of each significant predictor in the model is actually higher than the absolute percentage of variance explained by the predictor. For example, a predictor of strain (e.g., stressor ambiguity) may account for 6.00% of the 30.00% explained by the model; however, if this result is seen in proportional terms, it effectively explains 20.00% of the variance explained by the model. Furthermore, strain (the outcome variable) can be hypothesised as representing a heterogeneous mix of sub-components, for example, physiological and psychological symptoms of strain (Brown, Kirk, & Stanley, 1990; Kasl, 1998; Melin, Lundberg, Söderlund, & Granqvist, 1999; Osipow & Spokane, 1984, Selye, 1956, 1980). However, as the domain of strain is not measured accurately (i.e., account for all the sub-components), then again, there will be a loss of explained variance due to the restricted range of the constructs included in the scale.

2.2.4 Relationship Between Conceptual Models and Measurement Models of Occupational Stress

The focus of this thesis, therefore, is essentially concerned with nature and functional role of cognitive appraisal in the stressor to strain process. It is hypothesised that improved measurement of this cognitive process will increase the amount of the variance in strain explained over and above that explained by self-report of the amount of occupational stressors present in the work environment. That is, it proposes that the addition of personal meaning dimensions of appraisal (i.e., valence expectancy, belief, desirability and personality style) to the measurement model will account for variance in strain beyond that explained by the recognition (i.e., description) of common stressors. Figure's 2.2.1 and 2.2.2 depict (a) the nature of distinctions between S-R and S-O-R

conceptual models, (b) variations in the nature of measurement models used to operationalise theoretical models; and (c) examples of measurement models employed in stress research.

The thesis argues that the traditional stimulus-response (S-R) measurement model (see Figure 2.2.1) reflects a conceptual model which does not include individual differences in cognitive appraisal beyond the appraisal of quantity (i.e., recognition or detection of stressors) in terms of either agreement, frequency, duration or intensity (Aldwin, 1994; Zajonc, 1980). As the figure shows, objective and quasi objective (i.e., descriptive self-reports or observational forms of data) measurement techniques may be used to operationalise the S-R paradigm.

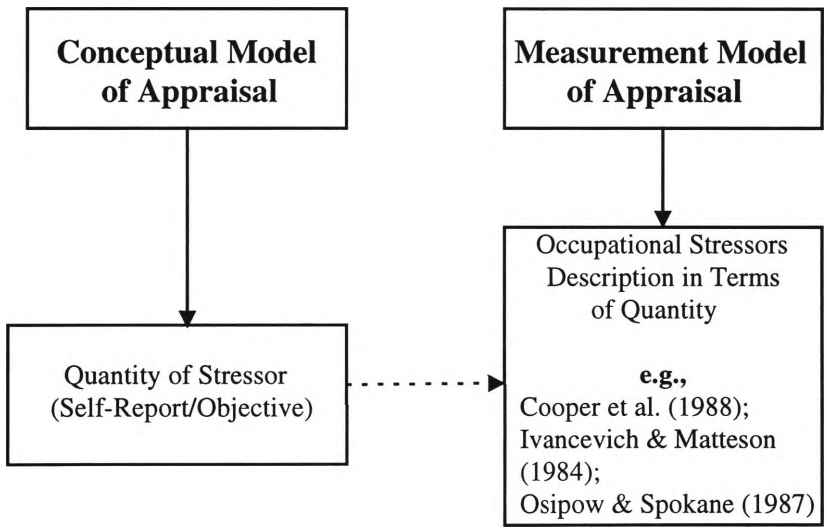


Figure 2.2.1 Simplified S-R Conceptual and Measurement Models of Stress

For example, the Cooper et al., (1988) stress inventory uses a descriptive (i.e., quasi objective) self-report format to measure the "pressure" (i.e., quantity in terms of intensity) of common work stressors. However, as further evident from the S-R paradigm,

there is no provision for either the moderating or mediational role of individual differences in the conceptual model. That is, there is, it would seem, no defined role for personal meaning appraisal processes in the measurement of work stressors.

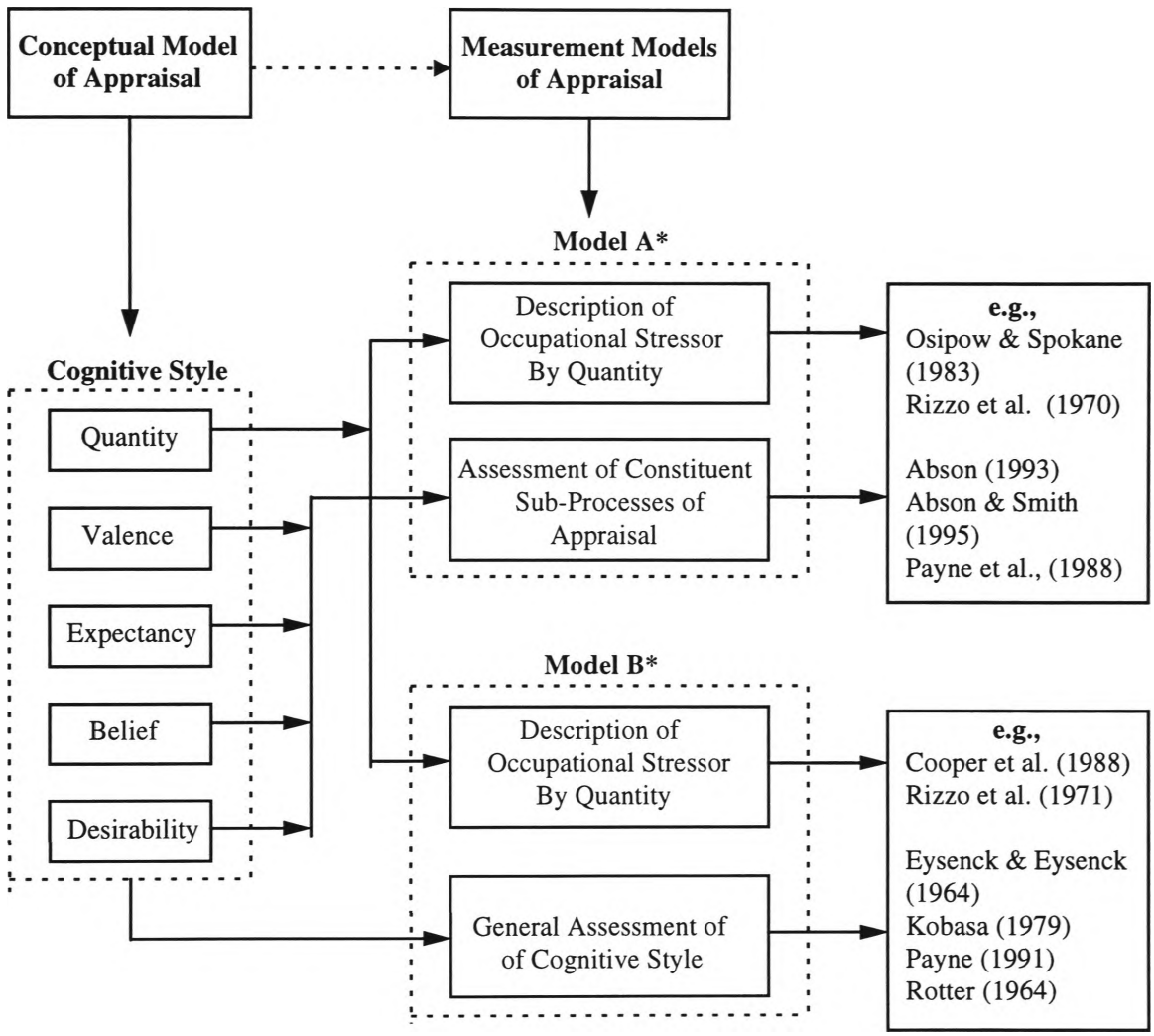
This thesis, therefore, proposes an alternative conceptual model of appraisal and some alternative measurement models to explore the self-report measurement and explanation of occupational stress (see Figure 2.2.2). The conceptual model of appraisal is hypothesised in this thesis as the focal point of individual difference. This contrasts with approaches which seek an understanding of individual difference by focussing on personalising work environment stressors — i.e., it is nomothetic rather than idiographic.

Furthermore, as indicted by Figure 2.2.2, the totality of the appraisal process may be conceptualised as either a totality or alternatively, it may be conceptualised in terms of several sub-components of appraisal. The former may be operationalised as a cognitive or appraisal style (e.g., hardiness, Type A), the latter as sub-components of appraisal such as valence, expectancy, belief and desirability. Therefore, the aim of the measurement model is to capture enough of the conceptual model to be useful in the explanation of the stressor to strain process - i.e., to obtain a sufficient overlap between abstract and concrete definitions of stress and contribute useful information to the explained variance (Bryman, 1989; French & Kahn, 1962; Lazarus, 1990; Scott & Howard, 1970; Smith, M., 1994; Webster & Starbuck, 1988).

2.2.5 Empirical Evaluation of Measurement Models

A series of studies are designed to explore the ability of measurement models A and B to explain additional variance in strain. In addition, (a) an omnibus appraisal model is formed from models A and B and (b) more complete measurement models of stress

formed from the inclusion of coping cognitive processes in the measurement model. Furthermore, variations in the composition of measurement models are used to (a) replicate and (b) triangulate the findings from the series of studies.



Note:
a) **Different Approaches to Response Scaling Examine Hypothetical Nature of Appraisal Process - i.e., Continuum of Responses or Categorical Response to Stressor.**
b) **Models A and B may be used to Form Single Dimension Measurement Models or alternatively, an Omnibus Measurement Model.**

Figure 2.2.2 Personal Meaning Models of Occupational Stress: Relationship Between S-O-R Conceptual Model of Appraisal and S-O-R Measurement Models of Appraisal

The early series of studies examines the measurement and relative effect of appraisal in models of stress using measurement model A then B; that is, they operationalise (i) sub-component models of appraisal (i.e., valence and expectancy) and (ii) cognitive style (i.e., Type A and locus of control) as a totality model of appraisal. Subsequent studies further explore the relative effect of model A (i.e., valence and expectancy) in models of stress.

Later in the series, a study is used to further examine measurement model A relative to model B; that is, it compares expectancy and belief dimensions of appraisal with neuroticism cognitive styles in models of stress. In subsequent studies, model A is used to explore the relative effect of higher order desirability appraisals in models of stress and later in the series, examines measurement models A and B relative to a more complete model of stress (i.e. include coping cognitive processes in the model).

Section Three

Rationale for the Thesis

2.3.1 Introduction

The amount of variance in strain explained by the effect of work stressors is a measure of how well a measurement model has effectively captured the transactional process (Cox, 1978, Lazarus, 1993) underlying occupational stress. As Payne et al. (1988) and other stress researchers note, existing measurement models invariably explain only a moderate amount of the variance in the translation of psychological stress to strain related outcomes (see also: Glowinkowski & Cooper, 1985, 1987; Payne, Jick, & Burke, 1982; Semmer, Zapf, & Greif, 1996). Four major reasons may be advanced to explain the reason for this shortfall. Each reason in its own right suggests pathways for further research. These are outlined below.

2.3.1.1 The Self-Report Measurement of Work Stressors

Typically the measurement of stressors focusses on the process of stressor recognition within transactional models of stress (see Figure 2.3.1). It does so in an essentially simplistic way by asking individuals to describe the degree to which common occupational stressors are present in the environment in which they live in terms of either agreement, frequency, duration or intensity (Dewe, 1991a; Motowidlo, Packard, & Manning, 1985; Newton, 1989; Newton & Keenan, 1985; Payne et al., 1988; Smith, P., 1994).

In the work domain, descriptive occupational stress measures (e.g., Cooper et al., 1988; Osipow & Spokane, 1983, 1987; Rizzo et al., 1970; Spector & Jex, 1998) typically limit the focus of self-report measurement to describing the nature of stressors within the work environment. The underlying assumption of this approach is that there is minimal difference in the meaning attributed to the magnitude of common occupational stressors among individuals. That is, the nature of the demand is assumed to reflect a common effect (see Section 2.1.2 and Fig. 2.1.1, - individual differences approach to self-report measurement). By comparison, the use of workplace specific and idiographic measurement to increase the explained variance are essentially dependent on a better (i.e., more specific) fit of stressors to the environment or the individual by further restricting the focus of measurement (Crump, Cooper, & Smith, 1980; Crump, Cooper & Maxwell, 1981; Dewe, 1991b, 1992;). They either contextualise stressors to a specific work environment shared by a group of people (see Section 2.1.2 and Fig. 2.1.1, - contextual approach) or alternatively, contextualise work stressors to the individual in his/her particular work environment (see Section 2.1.2 and Fig. 2.1.1, - idiographic approach). While this approach may increase the perceived relevance or meaning of the measure to the respondent, the increased face validity (i.e., more specific relevance of the stressor) is achieved at the expense of limiting the extent to which the results may be generalised to the wider context (Harris, 1995). Any attempt to generalise the results from studies using either context specific (i.e., workplace or occupational specific) or idiographic measures of occupational stress across individuals or across work groups, however, requires a qualitative reclassification of the results obtained from specific stressor measures into generic stressor categories.

An alternative approach is to seek to encompass in models of measurement both the stressor recognition process and the stressor appraisal process (see Section 2.1.2 and Figures 2.1.1 & 2.1.1a) within transactional models of stress (see Figure 2.3.1). This approach seeks to accommodate individual differences in the meaning of stressors by identifying and measuring some related dimensions in both processes (see Figure 2.3.4 and Sections 2.3.6 & 2.3.7 for further discussion). This approach to measurement is the key focus of this thesis and the research undertaken. It seeks to add a personal dimension to descriptive measurement through the measurement of the individual's appraisal of stressors. Furthermore, the validity of this approach may be examined using standardised individual difference measurement of generic work stressors which offers the advantage of allowing the quantitative generalisation of results across both individuals and across studies of occupational stress.

2.3.1.2 The Measurement of Strain

While the measurement of strain is not the primary focus of the thesis it is nonetheless important (Cooper & Bramwell, 1992; Cooper & Payne, 1992; Cooper & Williams, 1991; Hurrell Jr. et al., 1998; Kasl, 1998; Melin, et al., 1999; Newton, 1989; Osipow & Spokane, 1984; Payne et al., 1982; Rees & Cooper, 1991; Siegrist & Peter, 1994; Spector & Jex, 1998). Where appropriate, the research which follows uses a number of strain measures to assess the translational effect of stressor measurement. In particular, it is necessary to establish that any increase in the explained variance between stressors and strain is not simply an artefact of measurement resulting from measurement circularity in which stressor and strain measures become increasingly semantically over-

lapped (Frese & Zapf, 1988; Howard, 1994; Hurrell Jr., et al., 1998; Karasek et al. 1998; Kasl, 1978, 1998; Lazarus, DeLongis, Folkman, & Gruen, 1985; Lazarus & Folkman, 1986; Newton, 1989; Pratt & Barling, 1988).

2.3.1.3 The Measurement of Processes Which Mediate or Moderate the Translation of Stress Into Strain

The role of mediating and moderating processes is most clearly illustrated by research into the nature and effect of coping processes (e.g., Anshel, Robertson, & Caputi, 1997, Aldwin, 1994; Brown, Anshel, & Brown, 1993; Dewe, 1993; Folkman & Lazarus, 1985; Lazarus & Folkman, 1984; Madden, Summers & Brown, 1990; Siegrist & Peter, 1994) and personality (i.e., dispositional) factors in the mediation or moderation of stressors (e.g., Benishek & Lopez, 1997; Bohle, 1997; Cooper et al., 1988; Cooper & Payne, 1991, 1992; Cox & Ferguson, 1991; Harris, 1995; Kobasa, 1979, Payne, 1988a; Spector & O'Connell, 1994). Again, whilst important, this aspect of stress is not the focus of the present thesis.

2.3.1.4 The Measurement of Stress Across Multiple Environments

Strain may also be seen as a cumulative outcome of the stress experienced across the environments in which the individual lives both daily and over his/her life cycle (e.g., home/work interface - Cooper et al., 1988; family dynamics - Firth-Cozens, 1992; life events, stress and illness - Holmes & Rahe, 1967). Again, however, this aspect of stress is essentially outside the focus of this thesis.

2.3.1.5 Summary of the Rationale

This thesis has sought to explore the possibility that measurement of occupational stressors using a measurement model which considers both stressor recognition and stressor dimensions of appraisal will increase the meaningfulness of occupational stress meas-

urement. In doing so, it is seeking to examine a measurement model which better fits the stimulus-organism-response (S-O-R) configuration of occupational stress. S-O-R reflects a core feature (i.e., role of cognitive appraisal in the transactional process) of the transactional models of stress (see sections 2.3.4 & 2.3.6). The thesis seeks to reduce the slippage between conceptual models (see Fig. 2.3.4) and measurement models (see Section 2.1.2 and Fig. 2.1.1a) by measurement which is extended to encompass the cognitive appraisal process (Aldwin, 1994; Arnold & Gasson 1968; Cohen et al., 1995; Cox, 1978; Cox & Mackay, 1981; Dewe, 1991a, 1992; Fineman & Payne, 1981; Lazarus, 1982, 1984, 1993; Lazarus & Folkman, 1984; Monroe & Kelley, 1995; Payne et al., 1988; Peackock & Wong, 1990; Spielberger & Reheiser, 1995; Zajonc, 1980).

Figure 2.3.1 provides an overview of the conceptual model that depicts the transactional approach to stress; Figure 2.3.2 presents a simplified transaction model of stress; Figure 2.1.1 (see Section 2.1.2) provides a summary of the theoretical positions which underpin the uniqueness and utility of stress measurement; Figure 2.1.1a (see Section 2.1.2) summarises the dimensions of cognitive processes (i.e., recognition and appraisal) which underpin the extended measurement model explored in this thesis; and Figure 2.3.4 presents the conceptual model that reflects the transactional nature of the cognitive processes which underpin the personal meaning of work stressors as explored in this thesis. Taken together, these figures provide the basis for (a) the rationale of the thesis and (b) the focus of research which explores the extent to which the measurement model improves the understanding of the transactional process underlying the translation of psychological stress to strain outcomes.

2.3.2 The Importance of the Cognitive Meaning of Stressors

The nature and role of work demands in the transactional process of stress is by and large poorly understood (Glowinkowski & Cooper, 1985; 1987; Payne et al., 1988). As Payne et al. point out, current measures of work stressors in terms of either job characteristics (i.e., structural features or design of a job) or alternatively, the demands associated with a particular job role (e.g., teacher, nurse) only account for a moderate percentage of variance in measures of strain. Consequently, there is considerable room for improvement in (a) the identification of psychological factors (see Sections 2.3.1.2, 2.3.1.3, 2.3.1.4) which help to explain the transactional process and effects of occupational stress and (b) the measurement of work demands.

Current measures of work stressors essentially neglect the personal nature of the transactional process in the stress experience (Dewe, 1991a, 1992; Fineman & Payne, 1981; Hulin & Blood, 1968; Lazarus, 1995; Narayanan et al., 1999; Payne et al., 1988; Rizzo et al., 1970; Smith, P., 1994). They do not take into account the reality that what may be stressful for some may be challenging and enjoyable for others (Fineman & Payne, 1981; Newton, 1989; Payne et. al., 1988, Tetrick, 1992). Put another way, a work demand may be considered by people as either good or bad; as perhaps likely or unlikely to cause them stress; as a source of threat or alternatively, as a source of personal challenge (Bandura, 1986; Benner, 1984; Feather, 1992; Folkman & Lazarus, 1985; Harris, 1995; Jurgensen, 1978; Schabracq & Cooper, 1998; Wolff, 1953). Equally, a specific job demand (i.e., stressor) may be seen in terms of its personal desirability and therefore, individual's may differ in their desire for more or less of any particular stressor (Ajzen & Fishbein, 1980; Arnold, 1967; Arnold & Gasson, 1968; Caplan, Cobb, French, Van Harrison, & Pinneau, 1975; Dooley, Rook & Catalano, 1987; Edwards, 1992; French, Caplan, & Van Harrison, 1982; Lazarus et al., 1985;

Locke, 1968; Payne, 1979a; Payne et al., 1988). It is necessary, therefore, that measurement takes into account the functional and central role of cognitive meaning (James & Jones, 1980; James & James, 1989; Lazarus, 1982, 1984; Osgood et al., 1957; Zajonc, 1980) in the transactional process of stress (Brief & Atieh, 1987; Cohen, 1986; Harris, 1995; Jick, 1985; Lazarus, 1990, 1995; Monroe & Kelley, 1995; Schuler, 1985; Segovis et al., 1985; Smith, P., 1994).

2.3.3 The Measurement of Personal Meaning

Payne et al., (1988) reported that the measurement of work stressors using a descriptive and attitudinal approach to measurement provided an improved insight (and understanding) to the role of individual differences in the perception of work demands. The results showed that the perception (i.e., recognition) of work demands was often inversely related to the affective nature (i.e., emotional meaning) of the stressor. The respondents degree of satisfaction or dissatisfaction with work demands (i.e., desirability of stressors) did not necessarily reflect or vary in sympathy with the magnitude of the perceived demand. Job satisfaction, however, is a relatively weak measure of stressor desirability since it represents a more general dimension of appraisal (i.e., cognitive meaning) that captures both the conditions of work and the nature of work demands.

Desirability could be explored in terms of its emotional meaning to the individual. The use of this approach, however, requires a greater understanding of the complex nature and processes underlying the arousal and extinction of emotion than is currently the case (Aldwin, 1994; Arnold & Gasson, 1968; Brown & Farber, 1951; Cox, 1978; Crittenden, 1991; Davies, Stankov, & Roberts, 1998; Hobhouse, 1896; Lazarus 1966, 1982, 1984, 1990, 1993; Marsella, 1994; Salovey & Mayer,1990; Zajonk, 1980, 1984).

An alternative approach to the measurement of stressor desirability is to explore the cognitive meaning of work stressors in terms of the process of stimulus appraisal (Arnold, 1960, 1967; Arnold & Gasson, 1968; Cohen et al., 1995; Lazarus, 1966, 1995). This enables measurement to both draw directly on a well recognised transactional model of stress (Barone, 1995; Cox, 1978, 1985b; Cox & Mackay, 1981; Harris, 1995; Lazarus, 1995; Folkman & Lazarus, 1985) and on the extensive body of research concerned with the nature and measurement of cognitive appraisal (Anshel et al., 1997; Arnold & Gasson, 1968; Cox & Ferguson, 1994; Lazarus, 1993; Lazarus & Folkman; 1984, 1986, 1987; Lepore, 1995; Monroe & Kelley, 1995; Neale, Hooley, Jandorf, & Stone, 1987; Peacock & Wong, 1990; Spielberger & Reheiser, 1995; Schwartz & Stone, 1993).

As the Figure 2.3.1 shows, the transactional approach to stress reflects an integrated system of interaction that involves (a) cognitive recognition and appraisal processes, (b) coping responses, and (c) feedback to the cognitive processes and sources of resources and demand in a reciprocal process of adjustment to the appraised imbalance (i.e., stress) between the resources and demands (Cohen et al., 1995; Cox, 1978, 1987; Jick, 1985; Lazarus & Folkman, 1984; McGrath, 1976; Schuler, 1985). Since appraisal is the process used to distinguish the awareness of eustress from degrees of distress (Selye, 1980, 1983) - e.g., imbalance between actual and ideal demand, and as it is also informed by the perceived capability of being able to cope with the appraised demand, it lies at the core of the transactional model. As Figure 2.3.1 indicates, it is possible to focus the measurement of personal meaning at the output or the gestalt of the appraisal process (Hobfoll, 1988; Kaplan, 1983). The gestalt being seen as a point of measurement of the appraised imbalance, rather than an indicator of actual stress.

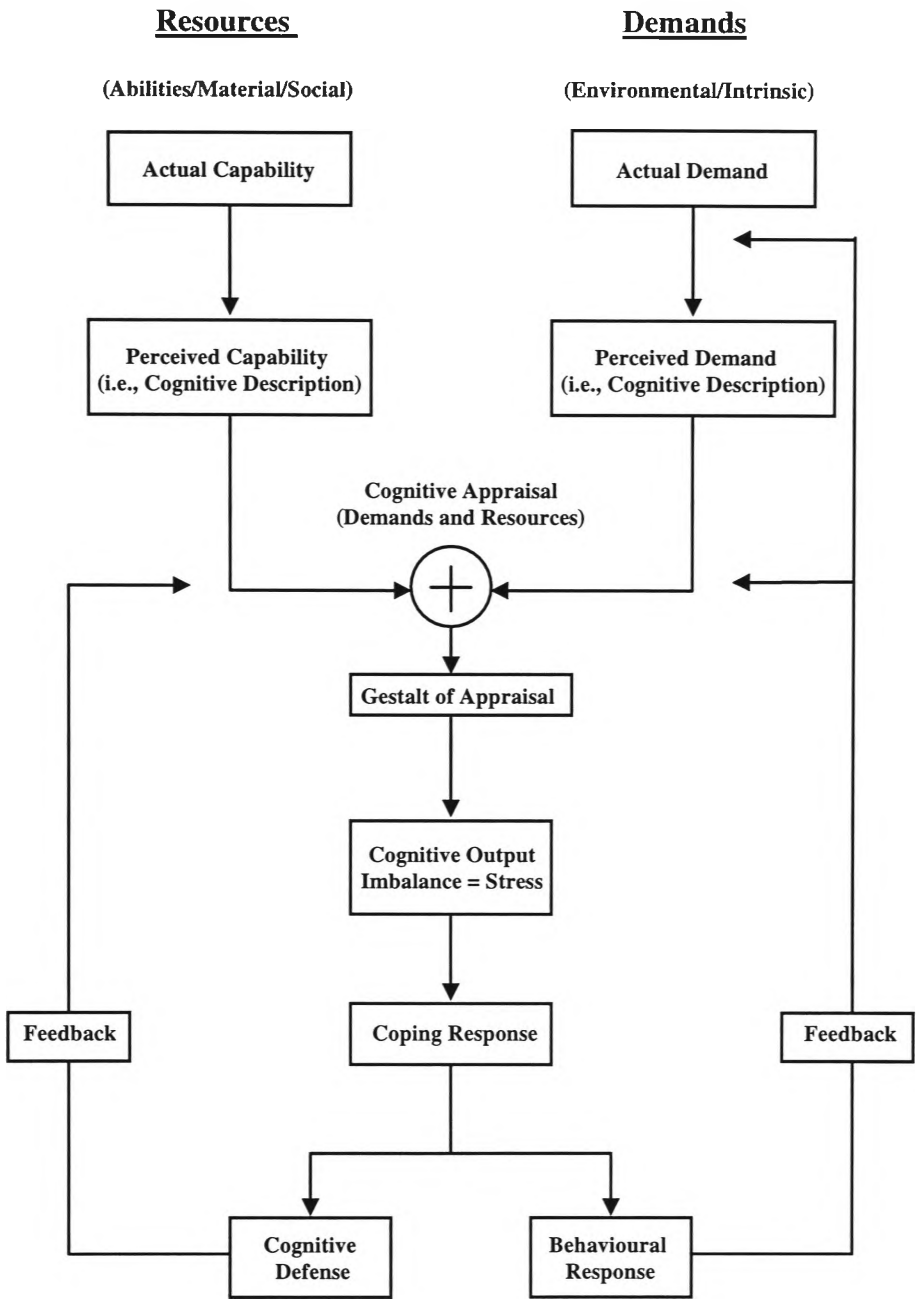


Figure 2.3.1 Transactional Model of Stress (After Cox, 1978, p. 19)

2.3.4 Approaches to the Measurement of the Appraisal Process

The functional role of appraisal in both the transactional model (Fig. 2.3.1) and the measurement model (see Section 2.1.2 and Fig. 2.1.1a) provides the basis by which to tap into the psychological processes used by the individual in the stress process. As the figures indicate, there is a need to tap the nature of stressors in two ways. First, there is

the requirement to consider the recognition of stressors, that is, the actual presence or absence of stressors and the magnitude of the stressors. The second, the need to consider the individual's appraisal of the stressors in terms that tap the personal meaning attributed to the work stressors.

Figure 2.3.2 provides a simplified view of the transactional approach to stress depicted in Figure 2.3.1. As the Figure indicates, the transactional approach to stress reflects a process of adjustment to the stress experience over a period of time. In essence, the process may be seen as a reciprocal process of exchange between the person and their environment that seeks to correct or reduce the individual's cognitive reaction (i.e., cognitive dissonance) to the appraised imbalance between actual and ideal demands. Therefore, to achieve a more valid or improved understanding of the stress experience, the explanation of stress requires the use of measurement techniques that are able to capture more fully the psychological factors involved in the transactional process of adjustment to stress.

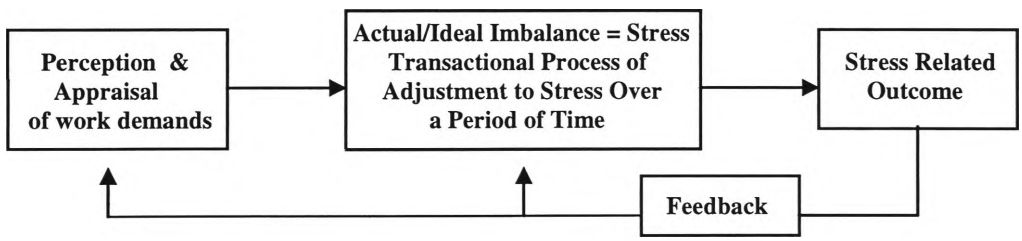


Figure 2.3.2 Simplified Transactional Model of Stress

However, as implied in both Figures 2.3.1 and 2.3.2, the ability of stress research to capture the complexity of the dynamic transactional process is essentially beyond the capability of current measurement and research techniques. It is feasible, however, to shift the focus of stress research to the cognitive inputs of the transactional process as a

means by which to achieve an improved understanding of the stress experience. For example, as shown in Figure 2.1.1a (see Section 2.1.2) the dimension of psychological appraisal may be broken down into components which can be measured as valency, expectancy, evaluation and personality. These appraisal measurement dimensions may be used to add additional meaning to stress measurement.

2.3.5 Alternative Approaches to Personalising Stressors

Figure 2.3.1 indicates that there are two possible approaches by which to personalise the transactional nature of work stressors. The first draws on the P-E fit approach to stress (Caplan, 1987; Caplan et al., 1975; French & Kahn, 1962; French et al., 1982; French, Rogers, Cobb, 1974; Hesketh & Myors, 1997; Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964; Pervin & Lewis, 1978) wherein, any calculated mismatch between work demands and personal resources is deemed to result in a state of stress. It could be argued that the resultant fit or balance state is itself a measure of the personal meaning of stress. The problem with this approach, however, is how to combine measures of the demand and resource elements (Harris, 1995).

An alternative approach is to focus on the joint appraisal of demands and resources (Cox, 1978, 1985a, 1985b, 1987; Cox & Mackay, 1981; Payne, 1979b). As indicated by the model, the appraisal of demand stressors is necessarily undertaken in the light of resource awareness. The resultant intensity and direction of this appraisal, as the model indicates, reflects the state of balance between the elements. Stressor appraisal measures, therefore, provide a means by which to tap the nature and intensity of personal meaning.

The perplexing problem that arises from this approach, however, is how to measure the appraisal imbalance. One approach, as already indicated, is to consider demand and resources in terms of an excess and measure the appraised imbalance of the reciprocal components (Cox, 1978, 1987; Edwards & Cooper, 1990; Glowinkowski & Cooper, 1987; Kahn et al., 1964; Shirom, 1982). The alternative approach, the one adopted by this thesis, is to focus on the demand side of the model and consider the resource component as an underlying factor in the recognition and appraisal of work stressors. Specifically, it is possible to consider stress in terms of an excess between actual demands and ideal demands and measure the appraised outcome (Cooper, 1983; Crump et al. 1980; Cummings & Cooper, 1979; Edwards, 1988, 1992; Locke, 1969). That is, stress may be seen as a cognitive outcome or dissonance that results from the imbalance between perceived demand (i.e., recognition) and the individual's appraisal (i.e., evaluation) of the perceived demand.

Furthermore, in terms of method, Figure 2.1.1 (see Section 2.1.2) indicates that it is possible to personalise the measurement of work demands using either individual differences, contextual or an idiographic approach to the measurement of work stressors. Moreover, as indicated by Figure 2.1.1 (see Section 2.1.2), the choice between methods used by stress researchers to personalise stress measurement may be largely determined by the underlying issues of uniqueness, scientific utility and applied utility.

2.3.5.1 Uniqueness of Measurement

The issue of uniqueness is essentially concerned with the capacity of measurement to contextualise the nature of the work environment at either the level of the individual, specific situation or the general context. Measurement is therefore based uniquely on each individual, on a particular work group, or on work in general.

2.3.5.2 Scientific Utility of the Approaches to Measurement

Scientific utility is concerned with the use of measurement in the development of theory. Traditionally, the individual differences approach to psychological science has been built on the results of quantitative research, since this approach to measurement underpins the scientific method. It provides the basis by which to standardise nomothetic scales of measurement for use in the wider environment. As Figure 2.1.1 (see Section 2.1.2) indicates, however, it is also possible to undertake research of a more qualitative nature and to use group and individual specific measures as a data source.

2.3.5.3 The Applied Utility of Measurement

The issue of applied utility is essentially concerned with the practical relevance of applied information to the nature and functions of a workplace. It may be enhanced by measurement that allows a direct comparison of the results from different workplaces.

2.3.6 Dimensions of Appraisal

The inclusion of dimensions of appraisal in the measurement model requires consideration of which dimensions to measure. As Benner (1984) points out, when appraisal is used to interpret a situation . . . "the focus is on the meanings inherent in the situation for the person, and how those meanings alter and are altered by the situation" (p.19). Therefore, to capture the nature of the appraisal process it is necessary to use measures of appraisal which tap the personal meaning of work stressors to the individual.

The concepts of expectancy and valence are common to both the stress and motivational literature (Ajzen & Fishbein, 1980; Bandura, 1986; Beehr & McGrath, 1992; Campbell & Pritchard, 1976; Cohen, 1986; Feather, 1992; Fishbein & Ajzen, 1975; Lazarus, 1966; Payne et al. 1988; Steers & Porter, 1991; Vroom, 1964). They therefore provide a potential starting point for the development of measurement dimensions.

As Figure 2.1.1a (see Section 2.1.2) indicates, expectancy and valence can be considered as belonging to four possible approaches to the measurement of cognitive appraisal or the personal meaning attributed to work stressors. These are the measurement of expectancies, valencies, desirability and at the more general level, personality difference. Each of these measurement dimensions may also be considered as measures of the extent to which work stressors are appraised as "normatively desirable" (Hesketh & Gardner, 1993, p. 326). Thus, they each provide an indication of the nature of the distribution of the norms of attitudes and behaviours.

These four dimensions may be used either individually or alternatively, combined by the use of either mathematical or statistical techniques into more holistic dimensions of personal meaning. For instance, the summation of expectancy and valence may be used as an alternative measure of desirability (Ajzen & Fishbein, 1980; Feather,1992; Vroom, 1964). Further, a personality dimension of appraisal such as hardiness, may also be seen as a process of appraisal that reflects the influence or combined effect of the lower order dimensions of appraisal. Therefore, the inclusion of a measure of personality such as hardiness in the measurement model may be appropriate, since general cognitive *personality sets* largely determine how individual's appraise stressors (Benishek & Lopez, 1997; Cox & Ferguson, 1991; Payne, 1988a; Pennebaker & Watson, 1988).

The treatment of valence and expectancy dimensions of appraisal in the measurement model draws heavily on the cognitive model of motivation proposed by Vroom (1964). The problem of motivation, as Vroom saw it, was. . ."to explain the choices made by an individual" when given the option for an alternative response (p. 8).

The basis for the problem of choice is in effect one of motives (French & Kahn, 1962; Lazarus, Deese, & Osler, 1952; Vogel, Raymond, & Lazarus, 1959; Singh & Baumgar-

tel, 1966; Vroom, 1964). That is, it reflects the involvement of positive (i.e., approach) or negative (i.e., avoidance) motives: the attraction of a particular state or outcome (i.e., valence); and the expectation of a particular outcome (i.e., expectancy). As Vroom notes, of the many ways to combine valence and expectancy, the preferred method is to assume that choice is the product of the two.

Another alternative is to seek to use stressor desirability within a P-E fit approach to stress (Caplan et al., 1975; Edwards, 1988, 1992; French et al., 1982; Schuler, 1980). The difficulty that arises from the mathematical approach to the calculation of P-E fit scores, however, is how it best to weight the P and E components used to calculate the P-E imbalance. In effect, this approach becomes somewhat problematic since there is no established apriori grounds (i.e., algorithms) or standards by which to assign relative weights to the P and E elements used in the calculation of the P-E imbalance.

However, an alternative solution to the problem of combining dimensions of cognitive appraisal (e.g., Ajzen & Fishbein, 1980; Caplan et al., 1975; Edwards & Cooper, 1990; French et al., 1982; Hesketh & Gardner, 1993) is to move directly to the output or gestalt of the mental summation process (Hobfoll, 1988; Kaplan, 1983). That is, to measure the appraised desirability of the work stressor, for example, in terms of the evaluative dimension "like more - like less".

The evaluative outcome of the appraisal process has been widely used in research (e.g., Henderson, Duncan-Jones, Byrne, & Scott, 1980; Locke, 1969, 1984; Rice, Gentile, & McFarlin, 1991). For example, Locke (1969, 1984) used an evaluative scale to investigate the relative importance of work conditions to the individual. Similarly, Caplan et al., (1975) used an evaluative approach in stress measurement with scale items presented in a "would like" or "would prefer" format to measure the desirability of work demands. For example, the evaluative questions "How much work load would

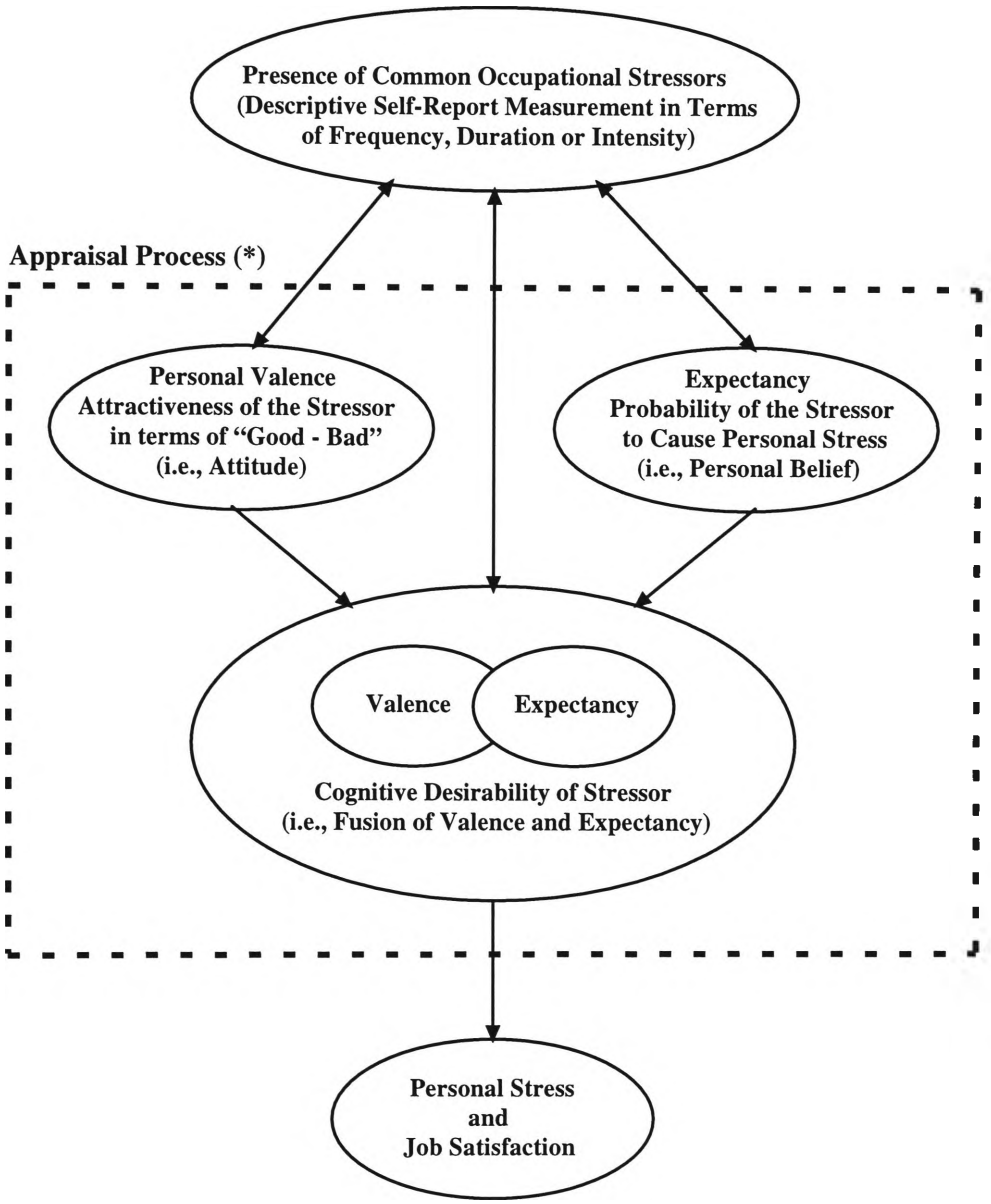
you like to have" and "How much time would you like to have to do all your work" reflect the nature of the items used to evaluate the quantitative nature (i.e., frequency of work demands) of the work load (p. 259). These evaluative stressor items were then paired with similar descriptive items (i.e., measures of perceived demand) to (a) calculate scores representing P-E fit (i.e., stress) in the work environment and (b) determine the increase in the explained variance of strain from the inclusion of the P-E fit scores in the measurement model. Therefore, as indicated by this research, in addition to the P-E approach to stress, the evaluative outcome of the appraisal process may also be measured as a rating of stressor desirability.

In contrast, to the P-E fit approach, this thesis focusses directly on the appraisal process in an attempt to better understand individual differences in the meaning of work stressors. The conceptual model that underpins the linkage of the measurement model with (a) the transactional process of appraisal, and (b) the translation of stress to either psychological stress or job satisfaction is shown in Figure 2.3.4.

2.3.7 Outline Model of the Appraisal Process

Figure 2.3.4 presents an outline model of the appraisal process in which the appraisal of stressors is described in terms of valence, expectancy and desirability. It also indicates how appraisal may be set within the wider concept of personality.

As the arrows in the model indicate, the appraisal processes of expectancy, valence and desirability reflect a transactional or reciprocal relationship (Benner, 1984; James & Jones, 1980) with the recognition process (i.e., perceived environment). Further, as shown in the model, the outcome of the appraisal process (i.e., degree of appraised imbalance) may be reflected in the related concepts of personal stress and job satisfaction (Caplan, 1983; Cooper et al., 1988; Payne, 1979a; Payne et al., 1988; Pervin, 1968).



(*) **The appraisal process may also be considered more generally as a reflection of individual personality - i.e., as a totality of the appraisal process or cognitive style**

Figure 2.3.4 The Functional Relationship of Descriptive and Personal Occupational Stressors and Personal Well-Being - The Personalisation of Common Work Stressors in Terms of Expectancy, Valence and Desirability

Chapter 3

The Importance and Role of Expectancy, Valence, Belief and Personal Desirability Dimensions of Appraisal in the Measurement and Explanation of Occupational Stress

Chapter 3

3.0 Plan of Chapter

This chapter is presented in three sections. Section one presents a theoretical introduction to the sequence of personal meaning (i.e., contextual meaning in terms of expectancy, valence and belief) studies which sought to explore the *personalisation* of contextual and intrinsic sources of stress. In addition, this section provides (a) an introduction to the statistical requirements and a review of the statistical considerations underlying the personal meaning and evaluative (i.e., personal desirability) segments of research; and (b) an outline of the four studies conducted in this strand of research. Following this, section two provides a detailed description and critical discussion for each of the four studies conducted in this segment of research; and section three, (a) a theoretical introduction to the evaluative stand of research, (b) a summary of the three studies conducted in the evaluative strand of research, and (c) a comprehensive description and critical discussion for each of the studies conducted in this strand of research.

Section one begins with a brief introduction to the theoretical focus and the general objectives for the sequence of personal meaning studies. Following this, it then provides (a) a theoretical introduction to the sequence of personal meaning studies; (b) an introduction to the statistical techniques used for the analysis of the data; (c) a review of the statistical assumptions underlying the validity of the findings obtained from the data; and (c) a brief description of the four studies conducted in this strand of research.

Section two provides a detailed description and critical discussion of the cross-sectional studies which sought to explore (a) the self-report measurement of the valence, expectancy and general beliefs assigned to intrinsic and extrinsic sources of stress; (b) the relative importance of personal meaning appraisal processes in the explanation of strain; (c) the effect of dispositional factors and the use of coping strategies in strain related outcomes. In addition, each study sought to evaluate measures of physical and psychological strain.

Section three presents a summary, theoretical introduction and comprehensive description of the three cross-sectional studies which explore the relative effect of the personal desirability (i.e., the desire for "more" "less" or "satisfaction" with a stressor) assigned to common work stressors (i.e., the recognition of work stressors) on symptoms of strain (Edwards, 1988, 1992; James & James, 1989; Kaplan, 1983; Locke, 1969, 1984). Together they explore the hypothesis that the personal desirability assigned to work related stressors adds significant information to the explained variance in symptoms of strain. That is, the studies sought to show that an evaluative or imbalance approach to the self-report measurement of the personal desirability assigned to work stressors explains additional variance in strain beyond that explained by (a) common work stressors, (b) the expectancy, belief and personal valence assigned to work related stressors, (c) coping strategies and (d) dispositions for hardiness (Cox, 1978, 1985a; French & Kahn, 1962; Kahn & Byosiere, 1992).

The evaluative studies sought also to further explore the relative effect of common work stressors when measured in terms of their frequency of presence in the work environment. In addition, study seven sought to triangulate (Cox & Ferguson, 1994; Ivancevich & Matteson, 1988; Jick, 1979, McGrath, 1970a) the results obtained from

frequency measures of common stressors (see studies one to four and study six) by shifting the focus of measurement to the perceived "intensity" (i.e., recognition of stressors in terms of "work pressures") of common work stressors (Buck, 1972; Cooper et al., 1988; Dewe, 1989; French & Kahn, 1962; Marshall & Cooper, 1979,1981; Payne,1979a; Wolfe & Snoek, 1962; Williams & Cooper, 1998).[1]

Therefore, in contrast to the expectancy focus of previous studies, this series of evaluative studies sought to show that the personal desirability assigned to common work stressors is a more powerful predictor of strain than the relative effect of expectancies assigned to common work stressors. Further, when seen in theoretical and applied terms, they sought to explore whether measurement of the personal desirability of work stressors has both heuristic and practical utility in the measurement and explanation of occupational stress.

[1] Triangulation, in broad terms, may be defined as . . . "the use of multiple methods to examine the same dimension of a research problem"; that is, it refers to . . . "collecting different kinds of data bearing on the same phenomenon" (Jick, 1979, p. 602).

Section One

Introduction to Personal Meaning Studies

3.1.1 Theoretical Focus and Aim of Research

This strand of research sought to explore the relative importance or the ability of (a) expectancy (i.e., self-referrent beliefs) and (b) valence (i.e., attitudes) dimensions of appraisal (i.e., the nature of the personal meaning assigned to common work stressors) to explain additional variance in strain when in the presence of common work stressors (i.e., the individual's recognition of common work-related stressors). In essence, then, this sequence of studies sought to identify the extent to which individual differences underlying the valence (i.e., attractiveness of work stressors) and expectancy (i.e., anticipations about the probable effect of work stressors) of common work stressors account for a significant percentage of the variance in symptoms of strain Therefore, taken together, the studies sought to test the hypothesis that measurement of common work stressors in terms of valence and expectancy significantly improves the self-report measurement and explanation of occupational stress (Payne et al., 1988).

The studies sought also to explore (a) the direct and moderating effect of personality cognitive styles (Payne, 1988a) on the variance in symptoms of strain, and (c) the mediating role of coping strategies in the stressor to strain process (Osipow & Spokane, 1983, 1987). In addition, they sought to explore the relationship between sources of stress and self-report measures of physical and psychological symptoms of strain (Brown, Wright, & McMurray, 1986; Hurrell Jr. et al., 1998; Osipow & Spokane, 1983, 1987; Seigrist & Peter, 1994; Smith, M., 1994; Smith & Bennett, 1983; Spector & Jex,

1998). That is, the studies sought to identify how well measures of physical and psychological strain are able to capture or account for the nature of the transactional process underlying symptoms of strain.

3.1.2 Theoretical Introduction to Personal Meaning Research

Stress, in transactional terms, is conceived as the emotional resolve of a reciprocal interaction or process of exchange between the person and their work environment (Barone, 1995, Cox, 1978; Harris, 1995; Lazarus, 1995; Lazarus & Folkman, 1987; Peacock & Wong, 1990; Spielberger & Reheiser, 1995; Tetrick, 1992). The nature of this process of appraisal and process of adjustment to sources of stress is variously described. For example, Lazarus et al. (1985) refer to the . . . "intervention of two complex systems, the person and the environment" (p.778). By contrast, Terry (1991) argues that stress is embodied in . . . "a person's subjective response" to the demands of their environment (p.29). While for Cox (1985a), stress relates to . . . "a complex psychological state derived from the person's cognitive appraisal of their adaptation to the demands of the work environment" (p.1155). This complexity in the application and utility of theory and measurement is further evident in the nature of (a) standardised (i.e., global) or situational specific stress inventories and (b) the degree of subjective emphasis in the self-report measurement of common work stressors, coping strategies, and strain related outcomes (Cox, & Ferguson, 1991; Dewe, 1991a; Lepore, 1995; Marsella, 1994; Monroe & Kelley, 1995; Payne et al., 1988; Spielberger & Reheiser, 1995; Smith, P., 1994).

Occupational stress inventories typically promote the utility of either nomothetic (i.e., context general) or situational specific (i.e., context specific) methodologies. Nomothetic (i.e., global) inventories reflect the view that people respond in an equivalent or normative manner to the stimulus properties (i.e., attributes or qualities) of common

work stressors or the effects of significant life events (e.g., Cooper et al., 1988; Holmes & Rahe, 1967; Karasek et al., 1998; Osipow & Spokane, 1983, 1987; Williams & Cooper, 1998). For example, the context general stress inventory designed by Osipow and Spokane measures the frequency of context general or common work-role stressors (Hurrell, Jr. et al. (1998) . As such, the inventory is in effect concerned with the descriptive nature (i.e., recognition of common work stressors) of impinging work-role stressors. By contrast, contextual stress inventories are primarily designed for situational purposes and thereby restrict the focus of measurement to the nature of situational specific sources of stress (Brief & George; 1995; Cox, 1991; Dewe, 1991b; Hurrell Jr. et al., 1998; McGee, Goodson, & Cashman, 1987). For example, Crump et al. (1980) describe the utility or the advantage of using context specific repertory grids as either a nomothetic or idiographic measure of the imbalance between the actual and ideal meanings associated with situational specific stressors (see also Crump, Cooper, & Maxwell, 1981; Smith et al., 1978). As these authors argue, pre-designed (i.e., global) stress inventories are often seriously deficient or disadvantaged by excluding important situational stressors (see also Hurrell Jr. et al., 1998). Moreover, global inventories tend to exaggerate the relative importance of predetermined sources of stress (Dewe, 1989). By comparison, self-report methodologies investigating occupational stress from an idiographic or case study reference (e.g., Crump et al., 1980) are essentially concerned with the nature and adaptive processes underlying the individual's subjective world of experience. The essential focus of measurement is on the personal meaning that individual's attribute to the nature of situational specific work demands, their subjective capabilities and their awareness of the possible consequences for their response to the source of stress (Cox 1978; Kasl, 1978; Lazarus, 1966, 1967; Lazarus & Folkman, 1987; Mischel, 1973; Peacock & Wong, 1990).

The self-report measurement of occupational stress, therefore, may focus on either the descriptive nature of situational factors in the work environment (Folkman & Lazarus, 1985; Freze & Zapf, 1988; Karasek et al. 1998; McGee et al., 1987; Payne et al., 1988); or alternatively, the emphasis of measurement may be shifted to the individual's subjective world of experience (Barone, 1995; Cox & Ferguson, 1991; Dewe, 1991a; Harris, 1995; Lazarus, 1995; Marsella, 1994; Spielberger & Reheiser, 1995; Tetrick, 1992). Cox (1978), for example, argues that psychological stress is in essence embedded in the cognitive imbalance between the individual's adaptive capability and the appraised nature of work-related demands. In other words, it reflects a transactional process of mutual exchange wherein the measurement and explanation of stress is required to focus on the nature of the individual's mood states and subjective world of experience rather than the descriptive nature of the work environment (Smith, P., 1994). That is, it embodies the notion that the emphasis of measurement should be placed on the individual's emotional or affective response to work stressors (i.e, personal meaning assigned to common work stressors) rather than the description of work stressors in terms of the agreement, frequency, duration or intensity of the impinging demand (Dewe, 1991a, 1991b; Payne et al., 1988; Smith, P., 1994).

Stress theorists have debated extensively the importance of considering the individual's mood states and subjective world of experience in addition to the perceived frequency, intensity or duration of stimulus-response events (Cox, 1978; Dewe, 1991a; Folkman & Lazarus, 1985; Payne et al., 1988). However, the reality of self-report stress measurement is very different. Stress measurement is essentially dominated by the current preference for descriptive self-report measurement of context general work stressors (Dewe, 1989, 1991b; Handy, 1988; Payne et al. 1988). In particular, standardised stress inventories possess the advantage of allowing a direct comparisons both

within and between occupational populations (Karasek et al. 1998; Williams & Cooper, 1998). However, as Payne, et al. (1988) point out, the use of descriptive scales for the measurement of stressor demands effectively discounts the affective context of subjective experience. Consequently, this approach to the measurement of work stressors is thought likely to substantially understate the explained variance in the relationship between work stressors and strain. Thus, in view of this deficiency, Payne et al. argue that it is necessary to include measures of both the descriptive and the affective (i.e., personal meaning) components of appraised demands if the validity (i.e., magnitude of the explained variance) and accepted utility of occupational stressor-strain measures is to be substantially improved.

The affective dimensions (i.e., personal meaning) of an impinging or expected stimuli are, however, as conceptually complex as stress itself (James & James, 1989; James & Jones, 1980; Marsella, 1994). These dimensions of personal meaning (i.e., components of the appraisal process) have been conceptualised as comprising of at least an attitude (i.e., good-bad evaluation), a belief (i.e., subjective expectancy judgement) and a conative (i.e., intentional) or motivational component (Ajzen & Fishbein, 1980; Feather, 1992; Lalljee, Brown, & Ginsberg, 1984; Lazarus & Folkman, 1984; Vroom, 1964). Furthermore, the functional involvement or the underlying effect of the attitude (i.e., valence) and belief (i.e., expectancy) dimensions of appraisal on behaviour is equally as complex. As Ajzen and Fishbein argue, ones intention (i.e. motivation) to perform a positive behaviour is essentially determined by the degree of imbalance or the relative importance between (a) one's attitudes and beliefs toward the behaviour, and (b) the influence of the individual's "subjective norms" related to the intended behaviour (p. 7). The transactional nature of beliefs and attitudes (i.e., their reciprocal rela-

tionship with sources of stress) and their functional operation is described by Ellis and Bernard (1985): "Beliefs refer to people's appraisals and evaluations of their interpretations, expectations, and inferences concerning reality" (p.11). By this reasoning, then, attitudes and beliefs are theorised to function as interdependent mediators or intervening appraisal processes between the person's complex of memories, thoughts and current personal experiences, and the consequent cognitive, emotional and behavioural reactions (Ajzen & Fishbein, 1980; Corey, 1986; Feather, 1992; Harris, 1995; Lazarus, 1993, 1995; Tetrick, 1992).

The dearth of stress research that includes measures of personal meaning dimensions of appraisal (e.g., measures of valence and expectancy assigned to common work stressors) alongside the more traditional descriptive approach to the self-report measurement of common work stressors (e.g., Cooper, et al., 1988; Osipow and Spokane, 1983) places a distinct limitation on the explanation of occupational stress (Payne et al., 1988). Furthermore, this deficiency in the measurement of work stressors may in effect be an important reason for the consistent inability of self-report measures of common work stressors to explain more than a moderate percentage of the variance in symptoms of strain (Glowinkowski & Cooper, 1985; Payne et al., 1988; Semmer, et al., 1996). The following sequence of personal meaning studies has sought to explore this deficiency in the self-report measurement of occupational stress.

3.1.3 Statistical Considerations

Stepwise and hierarchical regression techniques were the primary statistical techniques used to fulfil the statistical requirements for this sequence of studies (e.g., Buck, 1972; Cohen & Cohen, 1983; Osipow & Davis,1988; Osipow, Doty, & Spokane, 1985). A series of exploratory, model-building and evaluative regression models were used to

investigate the aims and hypotheses of the studies, the parsimony of computed regression models, and test the stated hypotheses of the respective studies. The SPSS statistical package (Norusis, 1988a, 1988b) was used for all statistical analyses.

3.1.3.1 Statistical Validity

Two underlying factors may be seen to influence the probability that sample data is able to detect significant and valid relationships within any population (Cohen, 1992; Skinner 1984). The first, involves the latent power of a test to reject a false null hypothesis. For example, for an R^2 medium effect size of 0.15, k = 8 and desired power of 0.8 at α 0.05 (Two-Tailed), a minimum sample size of 107 subjects is required to achieve the desired statistical power (Cohen, 1992, Table 2, p. 158). Second, sample size determines the "lower bound" for significant correlations. It determines the minimum correlation required for a significant correlation in the population from which the sample was drawn. Furthermore, sample size directly effects the underlying 95% confidence intervals for the significance of the correlation in the population.

3.1.3.2 Data Screening Assumptions

The preliminary examination of data for normality and acceptable reliability are essential data screening considerations (Brown & Di Milia, 1995; Cox & Ferguson; 1994; Orr, Sackett & Dubois, 1991; Tabachnick & Fidell, 1983, 1989). As Tabachnick and Fidell, (1989) further point out, significant violations of normality effect reduced correlations, with consequently, a subsequent decrease in both the stability and validity of regression analyses and the size of scale reliability coefficients. For example, the potential validity of a scale is essentially dependent on the size of the reliability coeffi-

cient: its reliability determines the maximum validity of a scale in that . . . "the maximum validity of a test is actually the square root of the reliability" (Sechrest, 1984, p. 47; Spector, 1994).

Furthermore, the detection of interscale multicollinearity, singularity and deviations from linearity are essential considerations both preceding and during a sequence of multiple regression analyses (Tabachnick & Fidell, 1983, 1989). For example, interscale correlations greater than 0.6 undermine the presumed independence of predictor variables in regression analyses (Bynner, 1988; Tabachnick & Fidell, 1989). Moreover, if two or more IVs are highly correlated, the variables may act as "suppressor variables" in regression analyses (Cohen & Cohen, 1983). Suppressor variables may in effect act to withhold significant predictors from the regression equation; or conversely, they may instead act to force or trick a non-significant IV into a computed model (Brown, et al., 1993; Cohen & Cohen, 1975; McGuigan & Moyer 1986; Tabachnick & Fidell, 1983, 1989). Thus, it is necessary to ensure the basic assumptions underlying regression analyses are satisfied both prior and during the sequential analysis of data. As such, it is necessary to remove both univariate and multivariate outliers from the data; detect abnormalities in the distribution of data; and to transform skewed continuous variables to approximate a normal distribution (Brown & Di Milia, 1995; Norusis, 1988a; Orr et al., 1991; Stone & Hollenbeck, 1989; Tabachnick & Fidell, 1989).

3.1.3.3 Multiple Regression Procedures

Stepwise and hierarchical regression techniques are typically used as exploratory, model building, comparative or causal modelling procedures (Cohen & Cohen, 1983; Wampold & Freund, 1987). These techniques provide a useful means by which to identify and/or discard variables which are poor predictors of a criterion variable (Tabachnick & Fidell 1989; Weiss 1976). Specifically, the statistical (i.e., stepwise)

regression technique is used to identify the "best linear combination" of independent variables which maximise the explained variance in criterion scores - i.e., identify the most parsimonious model (Tabachnick & Fidell, 1989, p.150). In contrast, hierarchical (i.e., forced entry) regression is used when there is a need to: (a) determine the theoretical (i.e., logical) or sequential importance of variables in theoretical models; (b) control the influence of nuisance covariance (i.e., "partial out" the common variance) prior to the logical assessment of a theoretical model; (c) test empirical hypotheses; or (d) determine the significance of higher order multiplicative (i.e., moderator or interaction effects) variables in theoretical models (Baron & Kenney, 1986; Cohen & Cohen, 1983; Stone & Hollenbeck, 1989).

3.1.3.4 Multiple Regression Considerations

The unique contribution of individual IVs to the explained variance is, however, somewhat ambiguous if the predictor variables are intercorrelated, multicollinear or singular in nature (Cohen & Cohen, 1983; Tabachnick & Fidell, 1989). Therefore, to place an absolute reliance on the incremental change in the variance, or the magnitude of the explained variance, may, in effect, disguise an underlying statistical distortion of the raw data. Moreover, stepwise regression solutions are highly sensitive to the influence of both sample-specific errors from multiple stages of analyses (i.e., inflated type 1 error rates) and sampling errors (i.e., method and error variance) within the raw data for the study (Cohen & Cohen, 1983; Weiss, 1976; Spector,1994). As a consequence, it is often necessary to conduct cross-sample analyses (i.e., cross-validate the initial analysis) before drawing any conclusions concerning the unique contribution (i.e., the validity) of predictor variables in regression solutions (Tabachnick & Fidell, 1989; Weiss, 1976).

Therefore, given that various sources of contamination may well influence the validity of regression solutions, the relative importance of IVs is preferably confirmed from an examination of differing regression estimates. For example, variables with both very low tolerance values and regression coefficients with high standard errors suggest the presence of highly correlated variables (Tabachnick & Fidell, 1989). Furthermore, a com-parison of the standardised beta weights and the associated predictor/criterion correlation provide an indication of the unique or relative importance of significant relationships in regression solutions (Brown, et al., 1993; Cohen & Cohen, 1983). In contrast, the part (i.e., semipartial) and partial correlations provide a more precise indication of the unique contribution of predictor variables in stepwise or forced entry regression solutions (Brown et al., 1993). For instance, the squared partial correlation reflects the percentage change (i.e., proportional reduction in error) in the explained variance accountable to an IV at each step of the regression analysis - i.e., the relative contribution of IVs at each step in the analysis (Cohen & Cohen, 1983; Howell, 1992; Judd & McClelland, 1989; Kirk, Brown, & Smith, 1995; Norusis, 1988b).

3.1.3.5 Regression Analyses and Tests for Sample Stability

The data analysis used both statistical (i.e., stepwise) and hierarchical regression techniques to identify significant predictors of strain, and the percentage of variance explained by differing regression models. Regression techniques are powerful predictive methods which allow the incremental and cumulative assessment of predictor variables in regression models (Cohen & Cohen, 1983; Tabachnick & Fidell, 1989). Stepwise and hierarchical techniques are particularly relevant when the aim is to identify the significance of cumulative and/or incremental increases in the explained variance (Christensen & Stoup, 1986; Tabachnick & Fidell, 1989).

Finally, if the sample size is large enough, it is desirable to cross validate the sample stability of stepwise regression models in order to verify that the results are not in effect an artefact of the research design or methodology (Weiss 1976; Tabachnick & Fidell, 1989). Cross validation can be achieved using a number of sampling regimes. These include: 50% random samples of the data base; 50% quasi random samples (i.e., samples based on odd and even case numbers); or alternatively, non random split-half samples of the case data base.

3.1.4 Expectancy/Valence Studies

A series of cross-sectional studies is used to explore the self-report measurement and relative effect of personal meaning dimensions of appraisal on the variance in symptoms of strain. In addition, the studies sought to evaluate the measurement of strain.

3.1.4.1 Study 1

This initial study sought to explore the relative importance of the personal meaning (i.e., expectancy and valence appraisals) assigned to common stressors in symptoms of strain. In addition, it sought to explore the relative effect of dispositions for Type A behaviour and locus of control and the use of coping strategies in the stressor to strain process. In particular, it sought to test the hypothesis that (a) the personal valence of common work stressors and (b) the expectancies assigned to common work stressors add significant information to the explained variance in strain beyond that explained by common work stressors.

3.1.3.2 Study 2

This study was designed to further explore the importance of personal meaning appraisal processes (i.e., valence and expectancy) in the explanation of the stressor to strain process. In essence, the study sought to compare the relative efficiency or the ability of commensurate (i.e., parallel) expectancy, valence and common stressor (i.e., recognition) scales to account for the variance in symptoms of strain. Using two independent samples, it sought to compare the relative efficiency of common stressor and personal meaning models of stress to explain the variance in symptoms of strain.

3.1.3.3 Study 3

Using a sample of migrant education teachers, this study sought to further explore the significant findings from study 1. That is, it sought to explore the relative effect of expectancies for common work stressors when in the presence of corresponding common work stressors on the explained variance in strain. In addition, it sought to further evaluate the measurement of physical and psychological symptoms of strain

3.1.3.4 Study 4

This study sought to identify the common stressors, personal meaning sources of stress, dispositional factors and coping strategies that influence the variance in symptoms of strain reported by youth workers employed in a juvenile justice centre. However, in contrast to previous studies which explore the personal meaning of common work stressors, this study sought to explore the relative effect of expectancies for psychological stress on job performance, and (b) personal beliefs associated with demands for social support on strain related outcomes. In addition, moderator analyses were used to further explore the moderating role of individual differences in the stressor to strain process.

Section Two

Expectancy/Valence/Belief Studies

Study 1

The Relative Importance of the Expectancy and Valence Assigned to Common Work Stressors in Occupational Stress

3.2.1.1 Abstract

Descriptive self-report stress inventories (i.e., the person's recognition of common work stressors) most often account for only a moderate percentage of the variance in measures of occupational stress. This study has sought to determine if the variance in symptoms of strain explained by a traditional nomothetic (i.e., global) stress inventory might be significantly improved by the inclusion of the personal meaning assigned to common work stressors in the measurement and explanation of occupational stress. Thus, it sought to explore the hypothesis that the relative importance of the valence and expectancy assigned to common work stressor adds significant information to the variance in strain explained by common work stressors.

Results obtained from the self-reports of 155 aircraft maintenance personnel provide some support for the importance of personal meaning dimensions of appraisal in the recognition and appraisal of common work-role demands. Expectancies (i.e., self-referrent beliefs) assigned to role-boundary and role-ambiguity demands explained an additional 7.40% (4.9% adjusted) of the variance in symptoms of strain beyond the 30.40% (adj) explained by the baseline common stressor model. Furthermore, the most

parsimonious model or the model of best fit from the variables used in the measurement model explained an increased 41.50% (adj) of the variance in strain. The cumulative effect of significant common work stressor, expectancy and coping predictors of strain adds an additional 6.00%(adj) to the 35.50% (adj) explained by the descriptive/expectancy model. In contrast, the personal valence of common work stressors, Type A behaviour and locus of control cognitive styles were not significant predictors of strain for this sample. Difficulties associated with the measurement of personal meaning dimensions of appraisal and directions for future research are discussed.

3.2.1.2 Aim of Study and Hypotheses

Previous discussion has argued that descriptive self-report stress inventories are invariably only able to explain a moderate percentage of the variance in symptoms of strain. In particular, the exclusion of personal meaning dimensions of appraisal (e.g., valence, expectancy, values and motivation) from the measurement and explanation of occupational stress seemingly restricts or limits the ability of stress inventories to account for the variability in measures of strain (Payne et al., 1988) . In addition, the moderating effect of dispositional cognitive styles on the perception of work stressors (Cox & Ferguson, 1991; Payne, 1988a; Rees & Cooper, 1992a) and the mediating effect of coping behaviours on strain related outcomes are not well understood in the sphere of occupational stress (e.g., Anshel et al., 1997; Carver, Scheier, & Weintraub, 1989; Dewe, 1991b, 1993, Edwards & Baglioni, Jr., 1993; Koeske, Kirk, & Koeske, 1993). Furthermore, with rare exception, there is, it would seem, little research on the ability of the OSI measures of strain to capture or account for the nature of the transactional relationship underlying sources of stress and symptoms of strain (Kagan, Kagan (Klein), & Watson, 1995; Osipow & Spokane,1984; Osipow, et al.,1985).

The primary aim of the study was to explore the proposition that, the inclusion of valence and expectancy measures of common work-role stressors alongside the descriptive work-role stressor scales (i.e., recognition of common stressors) of a context general stress inventory results in a significant increase in the explained variance of strain. In addition, it also sought to identify the relative importance of (a) Type A behaviour and locus of control cognitive styles and (b) coping strategies in the stressor to strain process. The study also examines how well the OSI dimensions of strain are able to capture or account for the nature of the transactional process underlying symptoms of strain (see Appendix A.4). It was hypothesised that:

H1 The valence and expectancy of common work-role stressors would each contribute significant information to the explained variance in strain beyond that explained by common work-role stressors (i.e., recognition of common work-role stressors).

H2 Type A behaviour and locus of control cognitive styles would (a) have a direct effect on strain outcomes, and (b) moderate the perception of work-role stressors.

H3 Dimensions of coping would mediate the relationship between common work-role stressors and strain outcomes.

H4 The cumulative effect of common work-role stressor, personal meaning dimensions of appraisal (i.e., valence, expectancy and cognitive style) and coping cognitive processes would account for a significant percentage of the variance in symptoms of strain beyond that explained by the individual cognitive processes.

3.2.1.3 Method

3.2.1.3.1 Participants

One hundred and fifty five aircraft maintenance personnel from the engineering department of a large aviation maintenance complex took part in the study (note: see also Singh & Baumgartel (1966) for a previous study of aircraft maintenance engineers). Of these, 151 were male aircraft maintenance personnel and 4 were female aircraft mainte-

nance engineers. The mean age was 34.5 years and ages ranged from 19 to 59 years. Further, as indicated by the biographical summary data for the participants, the sample represents a broad cross section of the maintenance personnel employed at the maintenance facility (see Appendix A, Table A.1).

3.2.1.3.2 Self-Report Measurement

A battery of self-report scales were used to measure the descriptive nature and personal meaning of work demands, personality characteristics, methods of coping with stress and symptoms of strain in the maintenance complex (see Work Stress Questionnaire, Appendix A.2). Specifically, self-report measures of (a) the frequency of work demands, (b) the expectancy (i.e., beliefs) and valence (i.e., attitudes) of work demands, (c) Type A behaviour and locus of control cognitive styles, (d) coping strategies and (e) dimensions of strain were used to identify the nature of work stressors and explain the effects of stress in the maintenance complex.

3.2.1.3.2.1 Descriptive Self-Report Measurement

The context general Occupational Stress Inventory (OSI) developed by Osipow and Spokane (1983, 1987) was used for the descriptive self-report measurement of common work-role stressors (see Appendix A.2.6), methods of coping (see Appendix A.2.8), and dimensions of strain (see Appendix A.2.7). Osipow and Spokane report that scales in the inventory show satisfactory psychometric properties with regard to test-retest reliability, internal consistency and construct validity. In addition the OSI provides a range of preliminary normative data collected from men and women in 103 occupations over a three year period. The OSI has attracted a wide range of application in field studies conducting stress audits or investigating specific aspects of occupational stress (e.g., Kagan, et al., 1995; Osipow & Davis, 1988; Osipow, et al., 1985) in work settings. That

is, it indicates (a) the acceptance of these scales in the field of stress research, and (b) the global utility of the work-role stressor, coping and strain scales used in this nomothetic inventory.

3.2.1.3.2.2 Measurement of Common Work Stressors, Coping and Strain

The Occupational Environmental Scale (OES) contains 60 items which measure the frequency of work related demands (see Appendix A.2.6). The six work-role stressor scales are designed to capture a complex of work demands concerning: (a) role-overload; (b) role-insufficiency; (c) role-ambiguity; (d) role-boundary; (e) role-responsibility; and (f) physical environment demands.

The Personal Resources Questionnaire (PRQ) consists of 40 items which measure a range of coping resources and adaptive strategies which people utilise to reduce or control the effects of perceived work demands (see Appendix A.2.8). That is, the scales are designed to capture the coping methods used by people to achieve states of psychological and physiological homeostasis. The four coping scales measure the individual's use of (a) social support; (b) recreational activities; (c) physical coping or self-care activities; and (d) rational/ cognitive techniques to cope with stressful demands.

The Personal Strain Questionnaire (PSQ) contains 40 items which measure four dimensions of strain related outcomes (see Appendix A.2.7). The scales measure facets of strain concerning: (a) vocational strain; (b) psychological strain; (c) interpersonal strain; and (d) physical symptoms of strain.

3.2.1.3.2.3 Measurement of Cognitive Style

The perception of person control (i.e., locus of control) and the tendency for Type A behaviour are two dispositional cognitive styles known to moderate the appraisal of stressors and strain outcomes (Cox & Ferguson, 1991; Motowidlo, et al., 1985; Payne,

1988a). The Cooper et al. (1988) Occupational Stress Indicator (OSI) includes the dispositional scales: "The Way You Behave Generally" (see Appendix A.2.3), and "How You Interpret Events Around You" (see Appendix A.2.4) for the measurement of Type A behaviour and locus of control respectively. These scales have been used extensively in stress research (e.g., Bradley & Sutherland, 1993; Rees & Cooper, 1990, 1992a, 1992b; Vagg & Spielberger, 1998) and therefore, seen as suitable for the requirements of the present study. Cooper et al. report satisfactory split-half reliability, content validity and construct validity for both scales.

Normative data for the OSI scales is provided in the OSI inventory. In addition, a data supplement to the OSI (Cooper, Sloan, & Williams, 1989) details revised normative data from the results of more recent field studies. The supplement also provides revised recommendations concerning the utility and limitations of the Type A and Locus of Control sub-scales used in the OSI. As a result, Cooper et al. recommend the use of total scores for the measurement of Type A behaviour and locus of control cognitive styles. Furthermore, they report also that total scores for the OSI scales correlate strongly with independent measures of the respective constructs. That is, the scales are considered to demonstrate satisfactory construct validity.

The OSI scale: "The Way You Behave Generally" contains 14 items which measure cognitive styles for behaviour related to the "Type A syndrome" of behaviour (see Appendix A.2.3). The sub-scales assess Type A behaviours concerning the individual's: (a) attitude to living; (b) style of behaviour; and (c) ambition. In addition, a composite scale Broad Type A is formed from the aggregate of the 14 items in the three sub-scales.

The OSI scale: "How You Interpret Events Around You" (see Appendix A.2.4) has 12 items which measure the individual's appraisal of their ability to control a diversity of organisational factors (i.e., provides a measure of the individual's locus of control). The four sub-scales measure the individual's appraisal of their control of (a) organisational forces; (b) management processes; and (c) individual influence. In addition, a composite scale "Broad View of Control" is derived from the sum of the 12 items used in the three sub-scales.

3.2.1.3.2.4 Commensurate Personal Meaning and Descriptive Stressor Scales

Three 12 item scales utilising the semantic differential technique (see also: Ajzen & Fishbein, 1980; Dawis, 1987; Levin 1965; Osgood, 1969; Osgood et al.,1957; Pervin, 1967; Warwick & Lininger, 1975) were devised for the measurement of the personal valence (see Appendix A.2.1, Work Stressor Valence Scale) and expectancy (see Appendix A.2.5, Work Stressor Expectancy Scale) assigned to common work stressors and the description (i.e., recognition in terms of agreement) of work stressors (see Appendix A.2.9, Perception of Work Stressors Scale) in the aviation complex. The questions in each scale were formulated sequentially from the structural concepts underlying the Osipow and Spokane (1983) work stressor scales. That is, the descriptive items were written first and later, if necessary, were slightly modified to suit the personal and conceptual emphasis of the valence and expectancy scales. Furthermore, for the measurement of the cognitive response to the scale items, the evaluative response anchors "true-false" identified by Osgood et al. (1957) and the bipolar (i.e., semantic differential) response scales used by Ajzen and Fishbein (1980) for the measurement of attitude and belief were adopted for the purposes of the present study. In other words, the use of bipolar response scales provide the individual with either a descriptive (i.e., "true"-"false") or personal (e.g., "good"-"bad") frame of reference by which to evaluate the

items in the respective scales (Osgood et al., 1957). Each scale used a seven point response range of +3 to -3 and a neutral or mid point of zero to measure the intensity of the valence, expectancy and descriptive nature of common work stressors.

3.2.1.3.2.4.1 Measurement of Expectancy and Valence

These instruments were designed to measure the personal intensity of the valence (i.e., attractiveness) and expectancy (i.e., the expected or anticipated effect of work demands) assigned to common work stressors (see Appendix A.2.1 & A.2.5). As Richardsen and Burke (1991) note: "Attitudes represent affective responses toward persons or objects" (p. 302). Similarly, the focus of the expectancy scale can be seen as essentially subjective or "self-referrent" in nature. That is, the scale is designed to tap the individual's personal expectations about the probable effects or the potential threat of work demands. As Lazarus & Folkman (1984) argue, beliefs (i.e., expectancies) become infused with an emotional component when a situational encounter involves the . . . "commitment to a value or ideal, another person or a goal, or when physical well-being is threatened (p.77).

The design of the personal meaning expectancy and valence scales draws heavily on (a) the theoretical concepts underlying the Ajzen and Fishbein (1980) "Theory of Reasoned Action" and (b) the findings of the Osgood et al. (1957) study which showed that dimensions of differential meaning may be seen to underpin the affective meaning assigned to stimuli. That is, the stressor expectancy and stressor valence response scales are in essence based on the theoretical assumptions underlying . . . "the logic of semantic differentiation" (Osgood et al., 1957, p.25). As Osgood et al. argue, the psychometric sensitivity of self-report instruments can likely be improved by utilising

differential or semantic anchors and the inclusion of a . . . "scale between each pair of terms so that the subject can indicate both the direction and the intensity of each judgement" (p.20).

Osgood et al. (1957) identified the cognitive factors: evaluation, potency and activity as the fundamental factors or root components employed in processes of cognition (i.e., the encoding and decoding of cognitive information). These factors or root components of cognition are seen as the fundamental constructs that underpin the basis and process by which people (a) make distinctions concerning the nature and qualities of objects and events, and (b) construct motivational intentions concerning the focus and objectives of intentional behaviours (see also: Rand, 1964). Osgood et al. were able to show that the . . . "quality and intensity of (the) meaning" attributed to a stimulus word (i.e., the cognitive response to a noun or concept) is determined by the use of bipolar adjectives or semantic differentials (p. 26). In other words, the attribution of meaning may be seen to reflect the involvement of clusters or orthogonal factors of bipolar descriptors (i.e., semantic differentials) to identify the direction and intensity of the cognitive response to the attributes or descriptive properties of word associations. That is, it involves the use of evaluative (i.e., emotional anchors such as clean-dirty), potency (i.e., descriptive anchors such as large-small) and activity (i.e., descriptive anchors such as fast-slow) dimensions of differential meaning to assess and impute meaning to the properties of stimulus words or concepts. For example, Osgood et al. found that the evaluative adjectives "good-bad" and "true-false" were frequently used by people to assign meaning to the attributes of a stimulus word. Likewise, the bipolar anchors "likely-unlikely" may also be seen as evaluative adjectives that people use to impute meaning to the properties of a concept or perceived stimulus (Ajzen & Fishbein, 1980).

3.2.1.3.2.4.2 Valence and Expectancy Scales

The valence scale was designed to evaluate in terms of "good-bad" the personal nature of respondents' valencies (i.e., the like or dislike) assigned to facets of job demands (see Appendix A.2.1). For example, the questions, "conflicting loyalties at work are:" and "job demands which exceed personal and company resources are:" in response to the evaluative or bipolar anchors "good-bad" reflects the semantic nature of the items in the scale and the emotional emphasis of the bipolar anchors used in this scale.

In contrast, the expectancy scale was designed to evaluate in terms of "likely-unlikely" the individual's expectancies (i.e., beliefs) concerning the expected effects from the exposure to work related sources of stress, that is, their personal reaction to sources of stress (see Appendix A.2.5). For instance, the questions, "having conflicting loyalties at work will cause me stress" and "job demands exceeding my personal and company resources will cause me stress" in response to the differential anchors "likely-unlikely" depict the semantic nature of the expectancy items and emotional emphasis of the response anchors used in the expectancy scale.

Corresponding items in the stressor valence and stressor expectancy scales can be seen as essentially commensurate in nature. However, subtle shifts in the wording of the items in the respective scales and the nature of the semantic poles for each scale effectively change the personal emphasis (i.e., stimulus attribute) of each scale. Accordingly, the valence and expectancy scales were considered to hold face and content validity (Edwards, 1991). That is, the valence, expectancy and descriptive scales were considered to represent independent constructs. Therefore, it was expected that the correlations between the valence and expectancy scales would likely be weak.

3.2.1.3.2.4.3 Short Form OSI Descriptive Stressor Scale

This scale was designed to measure the factual nature of work-role and physical environment stressors in the maintenance complex (see Appendix A.2.9). Therefore, in contrast to the affective or self-referrent emphasis of the valence and expectancy scales, this scale was designed to focus on the descriptive nature of their work environment (James & Jones, 1980; Lazarus & Folkman,1984, Rice et al. 1991). As such, the scale may be seen as essentially "job-referrent" in nature, that is, a descriptive measure of the individual's work environment. As Lazarus and Folkman (1984) point out, one's views about reality may be either subjective in nature (e.g., self-referrent beliefs) or conversely, may be seen as descriptive conclusions about the factual nature of reality. Factual descriptions, they argue, may be seen as . . . "pre-existing notions about reality, (they) determine what is fact, that is, 'how things are' in the environment, and they (help to) shape the understanding of its meaning" (p. 63). Thus, according to Lazarus and Folkman, descriptive information provides people with a cognitive basis by which to shape or understand the meaning of their life experiences and their view of the future. One's descriptions of the work environment, therefore, are in essence concerned with the nature of the present, with one's perception of what is true or false about their current circumstances, specific objects or contextual events.

The short form OSI stressor scale is essentially a commensurate derivation of the 12 item valence and expectancy scales. The 12 items used in the six sub-scales are semantically similar to those used in the personal meaning scales. However, subtle shifts in the wording of the items effectively reverts the semantic emphasis of the items to descriptive in nature. Further, with regard to measurement, the evaluative adjectives "true-false" identified by Osgood et al. (1957) provide the individual with a non-emotional bipolar frame of reference by which to evaluate or respond to the scale items

(see also: Smith, Kendall & Hulan, 1969). That is, the differential scale is designed to provide a descriptive measure of the intensity (i.e., magnitude) or the degree to which the aspect of work depicted in the items is perceived to be either "true" or "false" in the maintenance complex.

The short form OSI scale, therefore, is designed to measure in terms of "true-false", the descriptive nature of the individual's work-role and physical conditions of work. For example, the role-boundary item: "I experience conflicting loyalties at work"; and the role-overload item, "the demands of my job exceed my personal and company resources" with respect to the bipolar anchors "true-false" depicts the semantic nature of the scale items and the non-emotional or descriptive emphasis of the response anchors. The scale offering a range of responses from +3 to -3 and a neutral or mid point of zero to measure the intensity of the individual's response to the descriptive items. Furthermore, although semantically similar, because of subtle distinctions in the semantic nature of the items and the emotional emphasis of the response anchors used in the valence, expectancy and descriptive scales, the correlation between the scales was expected to be weak. Conversely, due to the generic nature of the short form OSI descriptive scales, it was expected there would be a low to moderate correspondence between this scale and the OSI stressor scales.

3.2.1.3.3 Design and Materials

This correlational field study required subjects to complete a battery of self-report questionnaires. However, the extensive nature of the inventory (i.e., 215 items in 9 questionnaires) increased the risk that responses may be subject to various sources of response bias—for example, item acquiescence, order and carry-over effects, mental fatigue, and/or boredom with the task (Anastasi, 1982; Christensen & Stoup, 1986; Oppenheim 1966; Warwick & Lininger, 1975).

Therefore, in an attempt to avert or discourage any tendency to acquiesce the emotional emphasis of the attitude items (i.e., provide a positive value for the stressful or dislike nature of negative valence items), the differential response scale for each item was reversed to the positive (i.e., non-stressful) direction. For example, for the question "Conflicting loyalties at work are:" and the response anchors "good-bad", the response categories (i.e. -3 through +3) for the differential anchors "good-bad" were reversed to allow a range of positive values (i.e., +3 to +1) for the anchor "good" and a range of negative values (i.e., -1 to -3) for the anchor "bad". Furthermore, as an added precaution, the questionnaires were *ordered* in the inventory in an attempt to eliminate any distortion or contamination of the self-report data due to boredom or cognitive carry-over effects. That is, following a careful consideration of the scales in the inventory and considering the similarity of the items in the valence and expectancy scales, it was decided to try and *break* any response continuity in the inventory by placing the valence and expectancy scales first and fifth in the inventory.

3.2.1.3.4 Procedure

Data collection was completed under two regimes. In the first regime, the researcher sought to recruit participants from groups of aircraft maintenance engineers attending technical courses at the company's technical training centre. This approach resulted in a low response rate. Specifically, 89 questionnaires were handed out, but only 28 participants returned completed questionnaires (i.e., a response rate of 31%). In the second regime, the researcher approached employees individually in their place of work. This personal approach was more successful: 127 out of 145 participants returned completed questionnaires (i.e., a response rate of 88.8%). Under both regimes of data collection, the pooled response rate was 66.86%.

Participants were informed that the research was interested in the study of emotions associated with work and that the questionnaires would take about 45 minutes to complete. They were then given an explanation of how to record their responses in the different questionnaires and then asked to complete the questionnaires in the presence of the researcher. If unable at the time, they were asked to complete the questionnaire at a more convenient time and return it to the researcher either personally or by the internal mail system. Where possible, participants were debriefed and the questionnaires checked for missing data in the presence of participants.

3.2.1.4 Results

3.2.1.4.1 Introduction

Descriptive statistics, Pearson zero-order correlations, exploratory factor analyses and a series of exploratory, model building and evaluative regression analyses were utilised for the statistical purposes of the study. In addition, qualitative results (see Appendix A.1.1) drawn from the comments of respondents during debriefing are used to complement or aid the explanation of the data obtained in the questionnaires.

3.2.1.4.2 Data Screening and Normality Assumptions

The screening of the raw data for any evidence of non-random missing values, violation of the assumptions for normality and linearity, and the presence of univariate and/or multivariate outliers was achieved using descriptive statistics, frequency plots and a sequence of multiple regression analyses (Brown & Di Milia, 1995; Norusis, 1988a; Orr et al., 1991; Tabachnick & Fidell, 1989). From these exploratory analyses, five univariate and two multivariate outliers were removed from the case data bank. A subsequent review of data base indicated that missing values were minimal and randomly

distributed. These were subsequently replaced with the variable mean score. The remaining 148 cases met the minimum requirement for a desired statistical power of 0.8 (i.e., for alpha 0.05 Two-Tailed, a minimum of 100 cases) and a case to IV ratio of not less than 5 cases for each IV in multiple regression analyses (Cohen, 1992; Tabachnick & Fidell 1989).

3.2.1.4.3 Descriptive Statistics

Descriptive statistics (n = 148) for the scale means, standard deviations (SDs), scale response range, skewness and internal consistency (i.e., Cronbach alpha coefficients) based on the collected data (n = 155) are shown in Appendix A.1.2. In addition, a summary of the variability data for the valence, expectancy and descriptive OSI common stressor scales and a graphical presentation of the response frequencies for the valence and expectancy scales is presented in Appendix A.1.3.

3.2.1.4.4 Scale Correlations

Pearson zero-order correlations (n = 148) for the OSI common stressor, dispositional, coping and OSI strain (i.e., sum of the items in the sub-scales) scales are shown in Table 3.2.1.1; those between the OSI common stressor, valence and composite strain scales in Table 3.2.1.2; those for the OSI common stressor, expectancy and composite strain scales in Table 3.2.1.3; those between the OSI common stressor, expectancy, composite expectancy and composite strain scales in Table 3.2.1.6; those between the valence, expectancy, dispositional and composite strain scales in Table 3.2.1.7; and those between the short form OSI stressor, expectancy, role-expectancy, valence, OSI common stressor, dispositional and composite strain scales in Table 3.2.1.8. The correlations reflect two-tailed tests for significance (i.e., $\leq 0.05^*$ or 0.01^{**} as indicated).

Correlations between the OSI common stressor scales and strain (Table 3.2.1.1) are in the main significant. In particular, role-boundary correlates a moderate 0.48** with composite strain and role-ambiguity 0.39** with composite strain. The 95% confidence interval for the estimated underlying correlations in the population (i.e., 0.17 to 0.42, sample size n = 200 and an observed correlation of 0.30) verify the statistical significance of the observed correlations (Skinner, 1984). Furthermore, with the exception of the correlation between role-overload and role-responsibility (0.62**), correlations between the OSI common stressor scales are in the main moderate or low in nature. As Tabachnick and Fidell (1989) point out, for any two variables, bivariate correlations above 0.7 should be excluded from the analysis. That is, the existence of a high correlation indicates that one of the variables is in effect redundant. Therefore, the variables should be collapsed into a single or composite variable; or conversely, one of the variables removed from the analysis. Interestingly, however, the data also indicates a low but significant inverse correlation of -0.17 ($p \leq 0.05$) between the Role-Insufficiency and Role-Responsibility scales. The correlation implies that increases in work-role responsibility either offsets or reflects as a reduction in the perception that one is underutilised in their work-role at the maintenance complex

Correlations between the dispositional variables (i.e., Type A behaviour and locus of control) and strain are not significant (i.e., 0.11 and 0.15 respectively). Furthermore, the relationship between Type A behaviour and locus of control (0.06) also is not significant. Consequently, the dispositional constructs may be seen as essentially independent variables. Similarly, correlations between Type A behaviour and the OSI common stressor scales also are not significant. For the locus of control scale, how-

Table 3.2.1.1
Correlations: OSI Stressor, Dispositional, Coping and Strain Scales

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
OSI Stressor																
1 Role-Ambiguity	- - -															
2 Role-Boundary	-.35**	- - -														
3 Role-Insufficiency	-.35**	.49**	- - -													
4 Role-Overload	.15	.22**	.07	- - -												
5 Role Responsibility	.05	.02	-.17*	.62	- - -											
6 Physical Environ	.11	.25**	-.00	.30**	-.00	- - -										
Dispositional																
7 Type A Behaviour	-.02	-.04	-.07	.00	.14	.05	- - -									
8 Locus of Control	.12	.26**	.13	.20*	.06	.27**	.06	- - -								
OSI Coping																
9 Recreational	-.35**	-.06	-.25**	-.03	-.16	.09	.01	-.07	- - -							
10 Physical	-.22**	-.12	-.17*	-.03	.02	.03	.04	-.11	.46**	- - -						
11 Social Support	-.18*	-.14	-.22**	-.12	-.15	.01	-.15	-.17*	.21**	.22**	- - -					
12 Rational/Cognitive	-.32**	-.12	-.19*	-.07	-.01	-.02	.12	-.11	.36**	.35**	.36**	- - -				
OSI Strain																
13 Vocational	.33**	.54**	.44**	.11	.05	.04	-.10	.12	.14	-.03	-.25**	-.33**	- - -			
14 Psychological	.34**	.39**	.23**	.16*	.19*	.01	.17*	.06	-.33**	-.35**	-.31**	-.28**	.47**	- - -		
15 Interpersonal	.35**	.23	.17*	.09	.17*	.13	.13	.18*	-.33**	-.26**	-.24**	-.19**	.33**	.60**	- - -	
16 Physical	.26**	.40**	.20*	.22**	.16*	.17*	.11	.14	-.26**	-.38**	-.25**	-.30**	.38**	.64**	.50**	- - -
17 Composite Strain	.39**	.48**	.31**	.19*	.19*	.12	.11	.15	-.34**	-.36**	-.33**	-.35**	.64**	.88**	.76**	.84**

Note: n = 148; * $p \leq 0.05$. ** $p \leq 0.01$ (two-tail)

ever, rather low but significant correlations with the OSI scales Role-Boundary, Role-Overload and Physical Environment are evident. Correlations between the dispositional and coping scales are either very low or not significant.

Correlations between the coping scales and strain are inverse in nature and all significant. Furthermore, the correlations between the coping scales are generally low and implies that the coping variables are essentially independent constructs. Similarly, the correlations between the strain scales are all below the 0.7 criterion for redundancy. Consequently, these scales can be seen as essentially independent in nature. Conversely, the correlations with the Composite Strain scale are in the main above 0.7 and indicates that this scale may be seen as a uni-dimensional or composite measure of strain.

Correlations between the valence scales and strain are not significant (see Table 3.2.1.2). Similarly, the correlations between the valence and OSI common stressor scales are either weak or not significant. As a result, the valence and OSI common stressor scales may be seen as essentially independent in nature. A further insight into

Table 3.2.1.2
Correlations: OSI Stressor, Valence and Composite Strain Scales

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13
Stressor OSI													
1 Role-Ambiguity	----												
2 Role-Boundary	.35**	----											
3 Role-Insuffic	.35**	.49**	----										
4 Role-Overload	.15	.22**	.07	----									
5 Role Responsib	.05	.02	-.17*	.62**	----								
6 Physic Environ	.11	.25**	-.00	.30**	-.00	----							
Valence													
7 Role-Ambiguity	-.01	-.02	.15	-.20*	-.11	.04	----						
8 Role-Boundary	.07	-.04	.12	-.02	.01	.05	.27**	----					
9 Role-Insuffic	-.10	.11	.27**	-.02	-.03	.07	.20*	.26**	----				
10 Role-Overload	-.07	.15	.11	-.14	-.16	.14	.17*	.19*	.16	----			
11 Role Responsib	-.04	.10	-.03	-.07	-.14	.17*	-.13	.01	-.01	.15	----		
12 Physic Environ	-.03	.14	.15	.26**	.19*	.05	.00	.24**	.27**	.15	.00	----	
13 Valence Comp#	-.08	.18*	.22**	-.04	-.08	.18*	.37**	.55**	.51**	.64**	.45**	.58**	----
Strain													
14 Comp Strain#	.39**	.48**	.31**	.19*	.19*	.12	-.10	.03	.02	.01	.09	.02	.03

Note: n = 148; * $p \leq 0.05$. ** $p \leq 0.01$ (two-tail); Comp#: Composite scale from sum of sub-scales

the basis for the low correlations between valence and strain is available from the variability statistics provided in the descriptive data and a graphical item analysis of the individual variables that form the valence and expectancy scales (refer Appendix A.1.2.& A.1.3 for details of these results).

Although rather weak, the correlations between the expectancy scales and strain (Table 3.2.1.3) are highly significant (i.e., ≤ 0.01). In particular, expectancy role-boundary correlates 0.26** with composite strain; expectancy role-insufficiency 0.25** with composite strain; and expectancy physical environment 0.24** with composite strain. The 95% confidence interval for the estimated underlying correlation in the population (i.e., 0.17 to 0.42, sample size n=200, and an observed correlation of 0.30) verify the statistical significance of the observed correlations (Skinner, 1984). Conversely, the correlations between the expectancy and OSI common stressor scales are in the main weak or not significant. As a result, the scales may be seen as essentially independent in nature.

Table 3.2.1.3
Correlations: OSI Stressor, Expectancy and Strain Scales

Scale	1	2	3	4	5	6	7	8	9	10	11	12
Stressor OSI												
1 Role-Ambiguity	----											
2 Role-Boundary	.35**	----										
3 Role-Insuffic	.35**	.49**	----									
4 Role-Overload	.15	.22**	.07	----								
5 Role Responsib	.05	.02	-.17*	.62**	----							
6 Physic Environ	.11	.25**	-.00	.30**	-.00	----						
Expectancy												
7 Role-Ambiguity	.04	.07	.12	.02	.07	-.13	----					
8 Role-Boundary	.00	.08	.10	.08	.08	-.16*	.66**	----				
9 Role-Insuffic	.04	.11	.01	.03	.21**	-.03	.60**	.57**	----			
10 Role-Overload	.03	.04	.03	.18*	.33**	-.13	.43**	.35**	.32**	----		
11 Role Responsib	-.06	.07	.04	.01	.06	-.01	.02	.12	.20*	.18*	----	
12 Physic Environ	-.01	.35**	.04	.24**	.27**	.17*	.10	.06	.22**	.25**	.29**	----
13 Comp Expect#	-.02	.18*	.09	.14	.26**	-.08	.73**	.73**	.75**	.66**	.48**	.50**
Strain												
10. Vocational	.33**	.54**	.44**	.11	.05	.04	.08	.14	.15	.13*	.17*	.21**
11. Psychological	.34**	.39**	.23**	.16*	.19*	.01	.17*	.26**	.25**	.24**	.10	.18*
12. Interpersonal	.35**	.23**	.17*	.09	.17*	.13	.19*	.16	.19*	.26**	.14	.17*
13. Physical	.26**	.40**	.20*	.22**	.16*	.17*	.22**	.25**	.20*	.15	.09	.20*
14 Comp Strain#	.39**	.48**	.31**	.19*	.19*	.12	.22**	.26**	.25**	.24**	.15	.24**

Note: n = 148; * p ≤ 0.05. ** p ≤ 0.01 (two-tail); #Comp: Composite scale from sum of sub-scales

Further, the correlations between the expectancy scales show evidence of moderate multicollinearity between the Role-Ambiguity, Role-Boundary, Role-Insufficiency and Role-Overload scales. For example, the Role-Ambiguity scale correlates 0.66** with Role-Boundary, 0.60** with Role-Insufficiency and 0.43** with Role-Overload. That is, the correlations imply that these scales carry common information and therefore measuring similar or common constructs. In comparison, correlations related to the Expectancy Role-Responsibility and Expectancy Physical Environment scales are weak and therefore that these scales may be seen as reasonably independent measures of the respective constructs.

A subsequent exploratory factor analysis of the 12 expectancy items using oblique rotation (i.e., correlated factors) provides some additional support for (a) the redundancy or composite nature of the expectancy scales which measure the personal meaning of ambiguity, boundary, insufficiency and overload common work-role stressors and (b) the independence of the Role-Responsibility and Physical Environment expectancy scales. As shown in Table 3.2.1.4, the three factor solution accounts for a high 77.0 % of the variance in the rotated factor solution (Tabachnick & Fidell, 1989). In short, the oblique solution identified three factors which indicate the presence of a composite Role-Expectancy scale and the independence of the Expectancy Role-Responsibility and Physical Environment scales. As a result, a composite eight item scale "Role-Expect-ancy" was formed from the sum of the items in the four expectancy scales which load on factor one.

Descriptive statistics for the Role-Expectancy scale and comparison statistics for the Composite Expectancy scale (see Appendix A.1.2, Table A.2) are shown in Table 3.2.1.5. Correlations between the OSI common stressor, expectancy and composite expectancy scales are shown in Table 3.2.1.6.

Table 3.2.1.4
Factor Analysis - Expectancy Scales: Principal Components Extraction with Oblique Rotation

Oblique Solution	Pattern Matrix Factor Loadings*		
Variables	**Factor 1**	**Factor 2**	**Factor 3**
Expect Role-Boundary	.894		
Expect Role-Ambiguity	.853		
Expect Role-Insufficiency	.799		
Expect Physical Environment		.842	
Expect Role-Overload	.315	.683	
Expect Role-Responsibility			.932
Variability Statistics			
Eigen Values	2.6075	1.250	0.761
Cumulative Variance	43.5%	64.3%	77.0%

Note: n = 148; Scale/subject ratio 1:24.7; * Factor loadings of 0.3 or greater shown

Table 3.2.1.5 provides a comparison of the descriptive data for the Role-Expectancy and Composite Expectancy scales. As indicated, the descriptive statistics suggest that both scales are essentially similar in nature. For instance, the skewness coefficients although slightly negative in direction, indicate that the data in both scales approximates a normal distribution. Furthermore, although essentially similar, the alpha coefficients indicate that the Role-Expectancy scale has a slightly higher internal consistency.

Conversely, the SD's for the Role-Expectancy and Composite Expectancy scales are roughly 2SDs below the expected approximate values (i.e., 9.5 and 11.5 respectively) for the observed range of responses and may reflect the negative skewness of the responses to the scale items. As a result, the variability of both scales is effectively reduced and the magnitude of the correlations with strain likely to be somewhat less than the value for a normal distribution.

Table 3.2.1.5
Descriptive Statistics: Role-Expectancy and Composite Expectancy Scales

Scale	Mean	SD	No Items	Scale Range	Observed Range	Skew	Cronbach Alpha
Role-Expectancy	37.466	7.626	8	8 - 56	16 - 54	-0.308	.84
Expect Composite	55.850	9.350	12	12 - 84	31 - 77	-0.172	.81

Note: n = 148

Table 3.2.1.6 shows the correlations between the OSI common stressor, expectancy, composite expectancy and OSI strain scales. Correlations between the OSI common stressor, Expectancy Physical Environment, Role-Expectancy and Composite Expectancy scales and the OSI strain scales are mainly significant. For example, the Role-Expectancy scale correlates 0.31 with the Composite Strain scale, the Composite Expectancy scale 0.35 with the Composite Strain scale and the Expectancy Physical Environment scale 0.24 with the Composite Strain scale.

Table 3.2.1.6
Correlations: OSI Stressor, Expectancy, Role-Expectancy and Strain Scales

Scale	1	2	3	4	5	6	7	8	9	10
Stressor OSI										
1 Role-Ambiguity	----									
2 Role-Boundary	.35**	----								
3 Role-Insuffic	.35**	.49**	----							
4 Role-Overload	.15	.22**	.07	----						
5 Role Responsib	.05	.02	-.17*	.62**	----					
6 Physic Environ	.11	.25**	-.00	.30**	-.00	----				
Expectancy										
7 Role Respons	-.06	.07	.04	.01	.06	-.01	----			
8 Physic Environ	-.01	.35**	.04	.24**	.27**	.17*	.29**	----		
9 Comp Expect#	-.02	.18*	.09	.14	.26**	-.08	.48**	.50**	----	
10 Role-Expect	-.01	.09	.09	.10	.22**	-.15	.16*	.19*	.91**	----
Strain										
11 Vocational	.33**	.54**	.44**	.11	.05	.04	.17*	.21**	.23**	.16
12 Psychological	.34**	.39**	.23**	.16*	.19*	.01	.10	.18*	.31**	.29**
13 Interpersonal	.35**	.23**	.17*	.09	.17*	.13	.14	.17*	.29**	.25**
14 Physical	.26**	.40**	.20*	.22**	.16*	.17*	.09	.20*	.29**	.26**
11 Comp Strain#	.39**	.48**	.31**	.19*	.19*	.12	.15	.24**	.35**	.31**

Note: n = 148; * $p \leq 0.05$. ** $p \leq 0.01$ (two-tail); Comp#: Composite scale from sum of sub-scales

Correlations between the Expectancy Role-Responsibility scale and strain, however, are mainly not significant. Similarly, the correlations between the OSI common stressor and expectancy scales are either small (i.e., ≤ 0.35) or not significant. Therefore, these scales can be seen as essentially independent in nature.

Table 3.2.1.7 details the correlations between the valence, expectancy, dispositional and composite strain scales. With the exception of the moderate 0.39 correlation between the Physical Environment scales, the relationships between the valence and expectancy scales are either low or not significant. Similarly, the 0.09 (p .273) correlation between the composite valence and expectancy scales is not significant. Therefore, it is reasonable to conclude that that the valence and expectancy scales measure independent constructs. Similarly, the correlations between the valence and expectancy scales and Type A behaviour are in the main either weak or not significant.

Correlations between the personal meaning scales and locus of control, however, tend to be slightly higher and reflect several low but significant correlations between the scales. For instance, the Valence Role-Responsibility and Physical Environment scales correlate 0.18* with Locus of Control; the Composite Valence scale 0.19* with Locus of Control; and the Expectancy Role-Ambiguity scale, an inverse -0.17* with the Locus of Control scale. That is, the valence correlations with locus of control imply that increases in the perception of low personal control (i.e., external locus of control) at work are related to increases in the dislike (i.e., response "bad") for facets of responsibility and poor physical working conditions. Conversely, the inverse belief correlation implies that reductions in the perception of negative effects from role-responsibility demands (i.e., unlikely to cause me stress) are in effect related to increasing perceptions of control (i.e., internal locus of control) at work.

Table 3.2.1.7
Correlations: Valence, Expectancy, Dispositional and Composite Strain Scales

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Valence																
1 Role-Ambiguity	----															
2 Role-Boundary	.27**	----														
3 Role-Insuffic	.20*	.26**	----													
4 Role-Overload	.17*	.19*	.16	----												
5 Role Responsib	-.13	.01	-.01	.15	----											
6 Physic Environ	.00	.24**	.27**	.15	-.00	----										
Expectancy																
7 Role-Ambiguity	.22**	.04	.14	-.04	-.16	-.08	----									
8 Role-Boundary	.15	.13	.09	.00	-.12	-.02	.66**	----								
9 Role-Insuffic	.10	.10	.30**	.00	-.10	-.08	.60**	.57**	----							
10 Role-Overload	-.01	-.13	-.01	.15	-.14	.11	.43**	.35**	.32**	----						
11 Role Responsib	-.15	-.03	.08	-.04	.30**	-.05	.02	.12	.20*	.18*	----					
12 Physic Environ	-.02	.12	.09	.04	.01	.39**	.10	.06	.22**	.25**	.29**	----				
Composite																
13 Valence	.37**	.55**	.51**	.64**	.45**	.58**	-.02	.03	.05	.01	.06	.22**	----			
14 Expectancy	.08	.06	.17*	.03	-.05	.07	.73**	.73**	.75**	.66**	.48**	.50**	.09	----		
Dispositional																
15 Type A Behaviour	.05	.02	.06	.03	-.04	-.11	.09	-.01	.16*	-.02	.02	-.05	-.02	.05	----	
16 Locus of Control	-.17*	.11	.13	.06	.18*	.18*	-.13	-.18*	-.04	.05	-.02	.16	.19*	-.05	.06	----
Strain																
17 Composite Strain#	-.10	.03	.02	.01	.09	.02	.03	.22**	.26**	.25**	.24**	.15	.24**	.35**	.11	.15

Note: n = 148; * $p \leq 0.05$. ** $p \leq 0.01$ (two-tail); #Composite Strain: Composite scale from sum of sub-scales.

Correlations related to the short form OSI common stressor scales are shown in Table 3.2.1.8. Correlations between the short form OSI common stressor scales and measures of strain are either small or not significant. For example, the short form OSI scales Role-Boundary and Role-Insufficiency both correlate 0.33** with the Composite Strain scale. Furthermore, correlations between the short form OSI common stressor scales tend to be moderate in nature and similar to the OSI common stressor scales, fall within three groups. The correlations between the ambiguity, boundary, insufficiency and overload scales tend to overlap or form a common group; conversely, the correlations between the responsibility and physical environment scales indicate that these scales are more independent in nature. Furthermore, although low and similar to the correlation between the OSI common stressor scales, there is an inverse -0.17* correlation between the short form OSI responsibility and insufficiency scales. In other words, for this sample, the effect of increased responsibility is related to a decrease in the perception of role-insufficiency or personal underutilisation in the maintenance complex.

Correlations between the short form OSI stressor and OSI descriptive scales are mainly moderate in nature and tend to fall within three groupings. That is, the correlations indicate that the ambiguity, boundary and insufficiency scales likely form a composite scale; those for the overload and responsibility scales, a second composite scale; and the overlap of the physical environment scales, a scale that is reasonably independent from the other scales. By contrast, correlations between the short form OSI common stressor, valence and expectancy scales are either low or not significant. As a consequence, these scales may be seen as essentially independent in nature. Similarly, correlations between the short form OSI common stressor and dispositional scales are in the main low or not significant.

Table 3.2.1.8
Correlations: Short Form OSI Stressor Scales With Expectancy, Role-Expectancy, Valence, OSI Common Stressor, Dispositional and OSI Strain Scales

Scale	1	2	3	4	5	6	7
Stressor (OSI Short)							
1 Role-Ambiguity	- - -	.54**	.47**	.33**	.00	.01	.62**
2 Role-Boundary	.54**	- - -	.37**	.43**	.16	.14	.73**
3 Role-Insufficiency	.42**	.37**	- - -	.10	-.17*	.06	.48**
4 Role-Overload	.33**	.43**	.10	- - -	.36**	.27**	.71**
5 Role Responsibility	.00	.16	-.17*	.36**	- - -	.15	.49**
6 Physical Environ	.01	.14	.06	.27**	.15	- - -	.48**
7 Composite OSI (SF)	.62**	.73**	.48**	.71**	.49**	.48**	- - -
Expectancy							
8 Role-Ambiguity	.10	.23**	.19*	-.07	.03	.00	.13
9 Role-Boundary	.05	.18*	.20*	.08	.07	-.02	.16
10 Role-Insufficiency	.09	.23**	.16	.02	.08	.07	.19*
11 Role-Overload	-.02	.12	.03	-.03	.28**	.04	.14
12 Role Responsibility	-.01	-.06	.08	.04	-.00	-.05	-.00
13 Physical Environ	.05	.17*	-.02	.07	.17*	.12	.17*
14 Composite Expect	.06	.22**	.17*	.03	.16*	.04	.20*
15 Role-Expectancy	.07	.24**	.19*	.00	.14	.03	.19*
Valence							
16 Role-Ambiguity	-.05	-.05	.11	-.12	.00	-.02	-.03
17 Role-Boundary	-.08	.01	.05	-.06	.02	.11	.02
18 Role-Insufficiency	-.07	.02	.14	-.13	-.08	.07	-.02
19 Role-Overload	-.13	-.02	-.04	-.27**	-.15	.04	-.17*
20 Role Responsibility	.02	-.09	-.02	.04	.19*	.05	-.07
21 Physical Environ	.08	.05	-.05	-.02	.22**	.02	.08
22 Composite Valence	-.08	-.03	.03	-.17*	-.06	.08	-.07
Stressor (OSI)							
23 Role-Ambiguity	.37**	.23**	.16*	.13	-.06	.03	.22**
24 Role-Boundary	.33**	.32**	.34**	.06	-.15	.07	.26**
25 Role-Insufficiency	.28**	.30**	.49**	-.07	-.16*	-.05	.20*
26 Role-Overload	.20*	.23**	.07	.49**	.47**	.30**	.52**
27 Role Responsibility	.12	.22**	-.04	.37**	.73**	.19*	.49**
28 Physical Environ	.04	.00	.08	.11	-.08	.55**	.20*
29 Composite OSI	.36**	.36**	.32**	.32**	.21**	.39**	.56**
Dispositional							
30 Type A Behaviour	.01	.08	-.06	-.08	.02	-.04	-.02
31 Locus of Control	.24**	.18*	.07	-.01	-.00	.10	.16
Strain							
32 Vocational	.32**	.25**	.38**	.00	-.14	.03	.22**
33 Psychological	.17*	.25**	.22**	.09	-.05	-.05	.17*
34 Interpersonal	.18*	.25**	.22**	.10	.00	.12	.24**
35 Physical	.23**	.30**	.25**	.14	-.01	.07	.26**
36 Composite Strain	.28**	.33**	.33**	.11	-.06	.04	.28**

Note: n = 148; * $p \leq 0.05$, ** $p \leq 0.01$ (two-tail); Composite: Composite scale from sum of sub-scales

3.2.1.4.5 Regression Analyses

A series of backward and hierarchical regression models were utilised to explore the relative effects or relationship of descriptive, personal meaning, dispositional and coping variables with measures of strain. In addition, hierarchical modeling was used to (a) identify the unique or incremental effect of expectancy and valence stressor scales when placed in the presence of semantically similar descriptive stressor scales, (b) identify the most parsimonious or the model of best fit for the variables used in the study, and (c) test the principal hypothesis (H1) of the study.

The analysis entailed (a) six baseline analyses which sought to identify the extent to which valence and expectancy personal meaning and OSI common stressor scales are able to explain the variance in composite strain; (b) a series of analyses which investigate the relative importance of commensurate valence and expectancy personal meaning scales and the parallel OSI common stressor scale in the stressor to strain process; (c) a series of model building and moderator analyses which sought to investigate the relative effect of valence, expectancy, dispositional, coping and moderator (i.e., interaction terms) variables in the presence of OSI common stressor scales; (d) models of best fit which illustrate the increase in the explained variance achieved by the addition of expectancy and coping variables to the OSI common stressor baseline model. Following these analyses, hierarchical modelling was then used to (a) identify the model of best fit, and (b) test the principal hypothesis (H1) of the present study. Finally, a sequence of backward regression analyses using 50% quasi random samples of the case data base were used to investigate the cross-sample stability of (a) the OSI common stressor and (b) composite OSI common stresssor/expectancy models. In addition, a

series of backward analyses are used to explore the relationship between OSI common stressor/expectancy predictors of strain and OSI dimensions of strain (see Appendix A.1.4, Table A.4).

3.2.1.4.5.1 Exploratory Analyses

The results from a series of baseline backward regression models which explored the relative effect of valence, expectancy, role-expectancy, short form OSI common stressor and OSI common stressor scales are presented in Table 3.2.1.9. The results show that the OSI common stressor, expectancy, role-expectancy, expectancy composite and short form OSI common stressor scales contribute useful information to the explained variance in composite strain. The OSI common stressors role-boundary, role-ambiguity and role-responsibility explain 30.44% (adj) of the variance in strain for this sample. By contrast, the expectancy scales Role-Boundary and Physical Environment account for a low 10.55% (adj) of the explained variance; the Role-Expectancy scale, 9.03% (adj) of the variance; the Composite Expectancy model (i.e., Role-Expectancy and Expectancy Physical Environment scales), 11.62% of the variance; and the short form OSI common stressor scales Role-Boundary and Role-Insufficiency, a substantially higher 14.16% (adj) of the variance in composite strain.

The valence scales, however, were not significant predictors of strain. As shown in the table, the Valence Role-Ambiguity scale although not a significant predictor of strain, was the most significant predictor of strain (i.e., t = -1.250, p .2131) for this sample. Moreover, the final solution (pout 0.051) was not significant {F(0,147) undefined} and explained 00.00% of the variance in symptoms of strain reported by this sample.

Table 3.2.1.9
Backward Regression: Baseline Models - Composite Strain on OSI Common Stressor, Valence, Expectancy and Short Form OSI Common Stressor Scales.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
OSI Stressor Scales	Role-Boundary			.3913	5.325	.0001
	Role-Ambiguity	31.86%	30.44%	.2481	3.373	.0010
	Role-Responsibility			.1685	2.446	.0156
Mult R=.5645; SE 13.8352; F(3,144) 22.4460, p .0000						
Valence Scales	Role-Ambiguity			-.1030	-1.250	.2131
	Role-Responsibility			.0868	1.052	.2944
	Role-Boundary	00.00%	00.00%	.0230	0.362	.7181
	Physical Environment			.0228	0.276	.7831
	Role-Insufficiency			.0157	0.189	.8503
	Role-Overload			.0055	0.067	.9469
Mult R=.0000; SE 16.5889; F(0,147) Undefined						
Expectancy Scales	Role-Boundary			.2503	3.203	.0017
	Physical Environment	11.76%	10.55%	.2195	2.808	.0057
Mult R=.3430; SE 15.6891; F(2,145) 9.6646, p .0001						
Role-Expectancy Scale#	Role-Expectancy	09.65%	09.03%	.3106	3.948	.0001
Mult R=.3107; SE 15.8224; F(1,146) 15.5858. p .0001						
Composite Expectancy##	Role-Expectancy	12.83%	11.62%	.2755	3.486	.0006
	Expect Phys Environment			.1818	2.300	.0229
Mult R=.3581; SE 15.5949; F(2,145) 10.6673, p .0001						
Short Form OSI Scales	Role-Boundary	15.78%	14.61%	.2450	2.991	.0033
	Role-Insufficiency			.2355	2.875	.0046
Mult R=.3972; SE 15.3288; F(2,145) 13.5799, p .0000						

Note: pout ≤ 0.051 (two-tail); #Role-Expectancy Scale: Composite Scale Derived From Sum of Ambiguity, Boundary, Insufficiency and Overload Expectancy Scales; ## Composite Expectancy Model: Role-Expectancy, Expectancy Role-Responsibility and Expectancy Physical Environment Scales.

3.2.1.4.5.2 Commensurate Scale Analyses

Table 3.2.1.10. contrasts the results from a series of backward regression models that investigate the relative effects or functional relationship of commensurate valence and expectancy scales and the parallel OSI common stressor scale in the explanation of strain. As the results show, for each model, the expectancy scale provides either an additional or independent contribution to the variance explained by the respective model. The valence scales, however, did not add significant information to the explained variance in any of the models. Thus, in view of this result, and those from the exploratory baseline analysis, the valence scales were excluded from subsequent analyses.

Table 3.2.1.10
Backward Regression: Composite Strain On Parallel OSI Common Stressor, Valence and Expectancy Scales.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T*
Ambiguity	OSI Role-Ambiguity	19.68%	18.57%	0.3698	5.193	.0001
	Expect Role-Ambiguity			0.2032	2.729	.0071
Mult R=.4436; SE 14.9696; F(2,145) 17.7610; p .0001						
Boundary	OSI Role-Boundary	28.47%	27.49%	0.4651	6.603	.0001
	Expect Role-Boundary			0.2289	3.250	.0041
Mult R=.5336; SE 14.1261; F(2,145) 28.8612; p .0001						
Insufficiency	OSI Role-Insufficiency	15.72%		0.3041	3.988	.0001
	Expect Role- Insuffic			0.2508	3.280	.0013
Mult R=.3964; SE 15.3343; F(2,145) 13.5183; p .0001						
Overload	OSI Role-Overload	8.09%	6.83%	0.2142	2.648	.0090
	Expect Role-Overload			0.1531	1.893	.0603
Mult R=.2845; SE 16.0129; F(2,145) 6.3844; p .0022						
Responsibility	OSI Responsibility	5.50%	4.19%	0.1823	2.254	.0257
	Expect Responsibility			0.1372	1.696	.0920
Mult R=.2344; SE 16.2375; F(2,145) 4.2154 p .0166						
Physical Environ	Expect Physic Environ	5.52%	4.87%	0.2350	2.921	.0041
Mult R=.2350; SE 16.1796; F(1,146) 8.5314; p .0040						

* pout ≤ 0.10, Two-Tail (SPSS Default).

3.2.1.4.5.3 Model Building Analyses

This sequence of backward regression analyses sought to identify the incremental effect or relative importance of expectancy, dispositional and coping variables when in the presence of (a) OSI common work stressor and (b) short form OSI common work stressor variables. Following these analyses, a sequence of moderator analyses were then used to explore the interactional effects of (a) expectancy*OSI stressor, (b) dispositional*OSI stressor and (c) dispositional*expectancy moderator variables (i.e., interaction terms) on the explained variance in strain. That is, to explore the relative effects of the moderator terms, forced entry analyses were used to identify the incremental effect or the unique contribution of the interaction terms when placed into the presence of the main effect terms (Baron & Kenny, 1986; Cohen & Cohen, 1983; Rice et al., 1991).

Expectancy Scale Analyses

The results in Table 3.2.1.11 show that expectancy and role-expectancy scales add usefully to the explained variance in strain when placed in the presence of the OSI common stressor scales. The OSI common stressor/expectancy model explains 35.47% (adj) of the variance in symptoms of strain; the OSI common stressor/role-expectancy model, 35.51% (adj) of the variance; and the OSI common stressor/expectancy composite model, a similar 35.51% (adj) of the variance in strain. Thus, when compared to the variance explained by the baseline OSI common stressor model (i.e., 30.44% adj), the inclusion of expectancy scales in the model adds 5.03% (adj) to the variance in strain explained by the OSI common stressor model. Similarly, the inclusion of the 8 item Role-Expectancy scale in the model adds a slightly increased 5.07% (adj) to the variance explained by the OSI model; and the inclusion of the composite expectancy scales

(i.e., Role-Expectancy, Expectancy Role-Responsibility and Expectancy Physical Environment scales) in the model, a similar 5.07% (adj) to the variance explained by the OSI common stressor model.

A subsequent statistical comparison of the OSI common stressor (see Table 3.2.1.9) and OSI common stressor/expectancy models using an F-test procedure (see Judd & McClelland, 1989; Mendenhall & Reinmuth, 1978) confirmed the increase in the explained variance as statistically significant ($F_{6,135} = 2.77$, $p \leq .05$). Specifically, the increase in the explained variance represents a proportional reduction of 11.0% in the sum of squares error and thereby an absolute increase of 7.40% (4.93% adj) in the explained variance from the relative effect of the Expectancy Role-Boundary and Role-Overload scales in the OSI common stressor/expectancy model.

Table 3.2.1.11 Backward Regression: Composite Strain on OSI Common Stressor and Expectancy Scales.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
OSI Stressor/ Expectancy	OSI Role-Boundary	37.22%	35.47%	.3683	5.186	.0001
	OSI Role-Ambiguity			.2695	3.804	.0002
	Expect Role-Boundary			.1752	.2.472	.0146
	Expect Role-Overload			.1744	2.466	.0149
Mult R=.6101; SE 13.3263; F(4,143) 21.1972, p .0001						
OSI Stressor/ Role-Expect	OSI Role-Boundary	36.82%	35.51%	.3628	5.102	.0000
	Role-Expectancy			.2805	4.213	.0000
	OSI Role-Ambiguity			.2691	3.801	.0002
Mult R=.6069; SE 13.3224; F(3,144) 27.9744, p .0000						
OSI Stressor/ Expect Comp#	OSI Role-Boundary	36.82%	35.51%	.3628	5.102	.0000
	Role-Expectancy			.2805	4.213	.0000
	OSI Role-Ambiguity			.2691	3.801	.0002
Mult R=.6069; SE 13.3224; F(3,144) 27.9744, p .0000						

Note: pout ≤ 0.051 (Two-Tail); #Belief Composite Model: Role-Belief, Belief Role-Responsibility and Belief Physical Environment Scales

A further series of backward regression and hierarchical modeling analyses were then used to explore both the relative effects and the incremental or unique effect explained by significant (a) Expectancy, (b) Role-Expectancy and (c) Composite Expectancy personal meaning scales (see Table 3.2.1.9) when placed in the presence of the Short Form OSI common stressor scales. For both sets of analyses, the short form OSI common stressor scales Role-Overload, Role-Responsibility and Physical environment were eliminated from the regression models as these variables did not correlate significantly with the Composite Strain scale for this sample (See Table 3.2.1.8). This sequence of analyses sought to determine (a) if expectancy scales and the short form OSI common stressor scales each contribute significant information to the explained variance when in the presence of each other, (b) the incremental effect or the extent to which individual expectancy scales add unique (i.e., significant) information to the explained variance when placed in the presence of semantically similar common stressor scales. In other words, this segment of analyses sought to determine if semantically similar self-report measures of self-referent expectancy measures of personal meaning and job-referent common stressors are in effect independent in nature and therefore unique predictors of strain.

Semantically Similar Scale Analyses

Table 3.2.1.12 indicates that the relative effect of both expectancy and role-expectancy personal meaning scales add useful information to the explained variance when in the presence of semantically similar common stressor scales.

As the results show, the cumulative effect of the expectancy scales Physical Environment and Role-Boundary add 5.92% (adj) to the 14.61% (adj) explained by the short form OSI common stressor scales; the Role-Expectancy scale, an additional 4.17% (adj)

to the explained variance; and from the result for the composite expectancy model, the expectancy scales Role-Expectancy and Expectancy Physical Environment add 6.51% (adj) to the variance in strain explained by the short form OSI common stressor scales.

Table 3.2.1.12
Backward Regression: Composite Strain on Expectancy and Short Form OSI Common Stressor Scales.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Short Form OSI Scales/ Expectancy	OSI Role-Insufficiency	22.69%	20.53%	.2282	2.841	.0052
	Expect Physical Environ			.1986	2.647	.0090
	Expect Role-Boundary			.1725	2.280	.0241
	OSI Role-Boundary			.1827	2.255	.0256
Mult R=.4763; SE 14.7881; F(4,143), 10.4948 p .0000						
Short Form OSI Scales/ Role-Expect	Role-Expectancy	20.44%	18.78%	.2237	2.906	.0042
	OSI Role-Insufficiency			.2103	2.617	.0098
	OSI Role-Boundary			.2009	2.470	.0147
Mult R=.4521; SE 14.9499; F(3,144) 12.3327, p .0000						
Short Form OSI Scales/ Comp Expect	OSI Role-Insufficiency	23.27%	21.12%	.2312	2.900	.0043
	Role-Expect			.1935	2.512	.0131
	Expect Physical Environ			.1741	2.296	.0231
	OSI Role-Boundary			.1706	2.101	.0374
Mult R=.4823; SE 14.7329; F(4,143), 10.8422 p .0000						

Note: pout ≤ 0.051 (Two-Tail);

Table 3.2.1.13 presents the results from a sequence of hierarchical analyses which sought to identify the unique or incremental effect of expectancy scales when placed in the presence of semantically similar stressor scales. As the results show, the expectancy scales add unique information to the explained variance beyond the 16.09% (14.34% adj) explained by the short form OSI common stressor scales.

Specifically, the expectancy scales Role-Boundary and Physical Environment add a significant 7.24% (6.29% adj) to the explained variance; the Role-Expectancy scale, an additional 5.01% (4.55% adj) to the explained variance; and from the results for the

composite expectancy model, the Role-Expectancy scale adds 5.01% (4.55% adj) to the explained variance and the Expectancy Physical environment scale, an additional 2.84% (2.37% adj) to the cumulative variance explained by the model.

Table 3.2.1.13
Hierarchical Regression: Composite Strain on Short Form OSI Common Stressor and Expectancy Scales.

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Signif F Ch	Beta	T	Sig T
	Step 1							
	Role-Ambiguity					.0692	0.734	.4643
Short Form	Role-Boundary	16.09%	14.34%	16.09%	.0000	.2145	2.332	.0211
OSI Stressor/	Role-Insufficiency					.2175	2.540	.0121
Expectancy	Mult R=.4011; SE 15.3533; F(3,144) 9.2039, p . 0000							
	Step 2							
	Expect Role-Bound	23.33%	20.63%	7.24%	.0017	.1814	2.385	.0184
	Expect Phys Environ					.2001	2.668	.0085
	Mult R=.4830; SE 14.7794; F(5,142) 8.6398, p. 0000							
	Step 1							
	Role-Ambiguity					.0692	0.734	.4643
Short Form	Role-Boundary	16.09%	14.34%	16.09%	.0000	.2145	2.332	.0211
OSI Stressor/	Role-Insufficiency					.2175	2.540	.0121
Role-Expect	Mult R=.4011; SE 15.3533; F(3,144) 9.2039, p. 0000							
	Step 2							
	Role-Expectancy	21.10%	18.89%	5.01%	.0031	.2332	3.012	.0031
	Mult R=.4593; SE 14.9403; F(4,143), 9.5577, p. 0000							
	Step 1							
	Role-Ambiguity					.0692	0.734	.4643
	Role-Boundary	16.09%	14.34%	16.09%	.0000	.2145	2.332	.0211
	Role-Insufficiency					.2175	2.540	.0121
Short Form	Mult R=.4011; SE 15.3533; F(3,144) 9.2039, p. 0000							
OSI Stressor/								
Comp Expect	**Step 2**							
	Role-Expectancy	21.10%	18.89%	5.01%	.0031	.2332	3.012	.0031
	Mult R=.4593; SE 14.9403; F(4,143) 9.5577, p. 0000							
	Step 3							
	Expect Physic Envir	23.94%	21.26%	2.84%	.0227	.1744	2.303	.0227
	Mult R=.4893; SE 14.7204; F(5,142) 8.9372, p. 0000							

Taken together, the results demonstrate that measures of personal meaning in terms of expectancy retain their relative importance in the presence of semantically similar common stressor scales. As a result, there is further evidence to support (a) the conceptual independence of expectancy and common work-role stressors, (b) the direct or

main effect of expectancies for common work stressors when in the presence of common work stressors, and (c) the relative effect or significant involvement of personal meaning sources of stress in the prediction of strain related outcomes.

Coping Scale Analyses

Table 3.2.1.14 indicates that coping strategies explain a significant percentage of the variance in strain when in the presence of OSI common stressors. As the table indicates, the use of physical (i.e, self-care methods such as regular exercise and correct diet) and social support coping strategies adds useful information to the explained variance in strain. Specifically, from the cumulative effect of OSI common stressors and coping strategies, the model explains an increased 41.98% (39.94% adj) of the variance in symptoms of strain. Moreover, when compared to the variance in strain explained by OSI common stressors, the relative effect of coping strategies in the model adds 9.5% (adj) to the 30.44% (adj) of the variance in strain explained by OSI common stressors. Furthermore, as indicated by the negative Beta weights for the coping variables, coping strategies function as mediators of strain in the model.

Dispositional and Moderator Analyses

Subsequent backward and hierarchical regression analyses explored (a) the relative effect of dispositional variables in the presence of OSI common stressors, and (b) the incremental effect of moderator terms when placed in the presence of the respective main effect scales.

The results show that the individual differences in dispositional styles for Type A behaviour and locus of control failed to add significant information to the variance in strain explained by the model. In addition, a series of moderator analyses found that the

unique effect of expectancy*common stressor, dispositional*common stressor and dispositional*expectancy moderator terms (i.e., interaction or multiplicative terms) were non-significant predictors of strain in the respective models. As a result, there was no support for the hypothesis (H2) that, individual differences in dispositions for Type A behaviour and locus of control would (a) add useful information to the explained variance in symptoms of strain, and (b) moderate the recognition of common work-role stressors. Due to these results, the dispositional variables were excluded from subsequent analyses.

Table 3.2.1.14
Backward Regression: Composite Strain on OSI Stressor and OSI Coping Scales.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
	Role-Boundary			0.3644	5.316	.0000
OSI Stressor/	Physical Coping			-0.2470	-3.694	.0003
OSI Coping	Social Support Coping	41.98%	39.94%	-0.1713	-2.553	.0117
	Role-Ambiguity			0.1742	2.492	.0139
	Role-Responsibility			0.1597	2.359	.0197

Mult R=.6479; SE 12.8565; F(5, 142) 20.5480, p .0000

Note: pout ≤ .051 (Two-Tail).

3.2.1.4.5.4 Models of Best Fit

A final series of backward analyses were used to identify the model of best fit or the relative importance of significant expectancy (see Table 3.2.1.9), coping (see Table 3.2.1.14) and OSI common stressor (see Table 3.2.1.9) predictors of strain. That is, this final segment of analyses sought to identify the model which provide the most parsimonious explanation of the variance in symptoms of composite strain reported by the sample.

Table 3.2.1.15 shows that the inclusion of coping variables in the presence of the OSI descriptive and expectancy scales explains a high 43.87% (41.480% adj) of the variance in composite strain. That is, the relative effect of coping in the model explains an additional 6.65% (6.01% adj) of the variance in strain beyond the 37.22% (35.47% adj) achieved by the OSI common stressor/expectancy model (see Table 3.2.1.13). By contrast, the inclusion of coping variables in the OSI common stressor/role-expectancy model explains a slightly lower 42.84% (40.83% adj) of the variance in strain. The model adds a reduced 6.02% (5.32% adj) to the 36.82% (35.51% adj) of the variance in composite strain explained by the baseline model. Furthermore, when compared to relative effect of the Expectancy Role-Boundary scale in the previous model, the solution indicates that the Role-Expectancy scale has an increased effect in the model (i.e., increase in the Beta weight from 0.1451 to 0.1900) Similarly, the inclusion of the coping variables in the OSI common stressor/expectancy composite model explained an equal 42.84% (40.83% adj) of the variance in strain. That is, the model adds 6.02% (5.32% adj) to the 36.82% (35.51% adj) of the variance in composite strain explained by the OSI common stressor/composite expectancy model.

In effect, the solutions for two latter models are essentially equivalent as the relative effect of the Expectancy Physical Environment scale is effectively nullified by the other predictors in the model. Therefore, when the results for the models are seen in comparative terms, the role-expectancy model is seemingly the most parsimonious model. That is, the variables in the model provide the most parsimonious explanation for the variability in symptoms of strain reported by the sample.

Table 3.2.1.15
Models of Best Fit: Composite Strain on OSI Common Stressor, Expectancy and OSI Coping Scales.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
	Role-Boundary			0.3548	5.233	.0000
	Physical Coping			-0.2018	-2.919	.0041
OSI/	Role-Ambiguity	43.87%	41.48%	0.1890	2.724	.0073
Expectancy	Social Support Coping			-0.1653	-2.492	.0138
Scales	Role-Responsibility			0.1403	2.187	.0304
	Expect Role-Boundary			0.1451	2.178	.0311
Mult R=.6623; SE 12.6903; F(6,141), 18.3652, p .0000						
	Role-Boundary			0.3492	5.118	.0000
OSI/	Role-Ambiguity			0.2042	2.921	.0041
Role-Expect	Role-Expectancy	42.84%	40.83%	0.1900	2.792	.0060
Scales	Physical Coping			-0.1829	2.648	.0090
	Social Support Coping			-0.1637	2.450	.0155
Mult R=.6546; SE 12.7603; F(5,142) 21.2886, p .0000						
	Role-Boundary			0.3492	5.118	.0000
OSI/	Role-Ambiguity			0.2042	2.921	.0041
Comp Expect#	Role-Expectancy	42.84%	40.83%	0.1900	2.792	.0060
Scales	Physical Coping			-0.1829	2.648	.0090
	Social Support Coping			-0.1637	2.450	.0155
Mult R=.6546; SE 12.7603; F(5,142) 21.2886, p .0000						

Note: pout ≤ .051 (Two-Tail); #Composite Expect: Role-Expectancy and Expectancy Physical Environment Scales

By way of summary, then, the inclusion of expectancy and coping scales in the presence of the OSI common stressor scales explained the highest percentage of the variance in composite strain. Therefore, ostensibly, this model would seem to be the model of best fit for the variables in the measurement model. In comparison to the other models, the solution for the model identified six significant predictors of strain and explained an additional 1.03% (0.65% adj) of the variance in composite strain beyond that explained by the other models. However, the change in the explained variance between this model and the OSI common stressor model using the role-expectancy and coping

scales in the model is not significant. That is, the forced inclusion of variables which are not common to both solutions (i.e., Role-Responsibility and Expectancy Role-Boundary scales) into the Role-Expectancy model failed to effect a significant change in the explained variance (i.e., R^2 ch = 1.392; F ch = 1.7478; Signif F ch = 0.1779). In other words, the injected variables do not explain or account for any significant additional variance beyond that explained by the scales remaining in the solution for the OSI common stressor/role-expectancy model. Accordingly, this model may be seen as the model which provides the most parsimonious explanation for the variability in symptoms of composite strain reported by the sample.

Furthermore, the results from the best fit analyses indicate support for hypothesis H3 that methods of coping mediate the relationship between work stressors and strain related outcomes. In addition, there is support for the hypothesis H4 that the combined effects of the variables in the model would explain a significant proportion of the variance in symptoms of strain beyond that explained by the individual models. As a result, the results provide some support for the hypothesis that (a) the recognition of common stressors, (b) the personal meaning assigned to common stressors, and (c) the mediating effect of coping strategies in the stressor to strain process have both direct and relative effects on the variance in symptoms of strain.

3.2.1.4.5.5 Hypothesis Testing

The statistical comparison of the OSI common stressor and composite OSI common stressor/expectancy models verified the finding that expectancies add useful information to the explained variance in strain. As a result, there is provisional support for the hypothesis that the inclusion of personal meaning measures (i.e., valence and expectancy) of common work-role demands in the presence of common work-role stressors would add significant information to the explained variance. This result, however, is

not based on a priori or substantive theoretical grounds. The significance of the finding is, in effect, based on the covert effects of chance ($p \leq 0.05$), statistical redundancy and the explanatory power of two independent models. Accordingly, hierarchical modelling (see Table 3.2.1.16) is in effect the more appropriate procedure when there is a need to assess the logical or theoretical importance of the variables in a conceptual model (Cohen & Cohen, 1983).

Table 3.2.1.16
Hierarchical Regression: Composite Strain on OSI Common Stressor and Expectancy Scales.

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI for B	T	Sig T
	Step 1								
	R-Ambiguity					0.234	0.30 - 1.40	3.067	.0026
OSI	R-Boundary					0.367	0.61 - 1.67	4.243	.0000
Stressor	R-Insufficien	32.54	29.67	32.54	.0001	0.078	-0.22 - 0.62	0.924	.3572
Scales	R-Overload					-0.064	-0.65 - 0.33	-0.648	.5180
	R-Responsib					0.233	0.11 - 1.13	2.400	.0177
	Physic Environ					0.016	-0.25 - 0.31	0.209	.8346
Mult R=.5704; SE 13.9124; F(6,141) 11.3334, p .0000									
	Step 2								
	R-Ambiguity					-0.022	-1.48 - 1.18	-0.217	.8282
Expectancy	R-Boundary					0.161	-0.19 - 2.23	3.203	.0972
Scales	R-Insufficien	39.92	34.58	7.39	.0144	0.068	-0.93 - 1.97	0.709	.4792
	R-Overload					0.122	-0.26 - 1.94	2.808	.1348
	R-Responsib					0.071	-0.48 - 1.41	0.981	.3283
	Physic Environ					0.014	-0.98 - 1.17	0.174	.8619
Mult R=.6320; SE 13.4174; F(12,135) 7.4753, p .0001									

Table 3.2.1.16 shows the incremental change in the explained variance that results from a theoretical assessment of the OSI common stressor and expectancy scales; that is, the result reflects the forced or sequential entry of the OSI common stressor and expectancy scales into the model. As the results show, the incremental or unique effect of both sets of variables contribute significant information to the variance in strain explained by the model. In particular, the inclusion of the expectancy scales in the model

accounts for an additional 7.4% (i.e., 4.91% adj) of the explained variance. Thus, based on this result and that from the previous statistical comparison of the OSI common stressor and personal meaning expectancy scales, there is both theoretical and statistical support for the hypothesis (H1) that the personal meaning assigned to common work-role stressors would contribute significant information to the explanation of strain.

3.2.1.4.5.6 Cross-Sample Stability

The cross-sample stability of the OSI common stressor and OSI common stressor/expectancy models was tested using a sequence of backward regression analyses and 50% quasi-random samples (i.e., odd/even case number) of the case data base (Tabachnick & Fidell, 1989). The results of these analyses are shown in Table 3.2.1.17.

Table 3.2.1.17
Backward Regression: Cross Sample Stability - Composite Strain on OSI Common Stressor and OSI Common Stressor/Expectancy Models.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
OSI Stressor	Role-Boundary	24.87%	22.78%	0.4257	4.165	.0001
Odd Sample n = 75	Role-Responsibility			0.2736	2.677	.0092
Mult R=.4987; SE 14.4131; F(2,72) 11.9165, p .0001						
OSI Stressor	Role-Boundary	37.44%	35.65%	0.4561	4.636	.0001
Even Sample n = 73	Role-Ambiguity			0.3007	3.056	.0032
Mult R=.6119; SE 13.5504; F(2,70) 20.9466, p .0000						
OSI Stressor/	Role-Boundary			0.3460	3.308	.0015
Expectancy	Role-Ambiguity	39.00%	35.52%	0.3000	2.815	.0063
Odd Sample n = 75	Expect Role-Boundary			0.2557	2.428	.0177
	Expect Role- Overload			0.2461	2.293	.0249
Mult R=.6245; SE 13.1711; F(4,70) 11.1894, p .0001						
OSI Stressor/	Role-Boundary	37.44%	35.65%	0.4561	4.636	.0000
Expectancy	Role-Ambiguity			0.3007	3.056	.0032
Even Sample n = 73						
Mult R=.6119; SE 13.5504; F(2,70) 20.9466, p .0001						

Note: pout ≤ .05 (Two-Tail)

Taken together, the results shown in Table 3.2.1.17 demonstrate that the regression models retain reasonable stability across the quasi-random samples. That is, they indicate that the findings of the study are in effect not an induced artefact of the methodology.

3.2.1.5 Discussion

The findings of this study have shown that the prediction of strain within a descriptive nomothetic framework can be significantly improved by the inclusion of personal meaning measures of work-role stressors in the measurement model. Self-report measures of the participants self-referrent expectancies (i.e., anticipations) concerning the expected effect of common work-role stressors were found to explain a significant percentage of the variance in symptoms of strain when in the presence of the OSI common stressor scales. As the results show, the relative effect of the participants expectancies assigned to common role-boundary and role-overload stressors were found to add 4.93% (adj) to the 30.44% (adj) explained by the OSI descriptive scales. This result is in effect a significant increase above that obtained by the OSI common stressor model and indeed substantially higher than the 1.0% criterion used by Dewe (1991b) and likewise Travers and Cooper (1993) or the more conservative 4.0% criterion recommended by Hobfoll (1988) for each additional IV in the final equation.

The relative power of the expectancy stressor scales is further evident from the finding that expectancy scales contribute useful information to the explained variance in analyses that sought to identify the *cumulative effect* or the model of best fit from significant common stressor, expectancy and coping predictors of strain identified in model building analyses. The relative power of expectancies in the model is explicit from the "order of significance" of the variables remaining in the final equations for the

best fit analyses. As shown in Table 3.2.1.15, the two item expectancy Role-Boundary scale, although significant in the model, was the weakest predictor (Beta 0.1451, sig t = 0.0311) of strain in the expectancy scale model. By contrast, for the models using the Role-Expectancy and Composite Expectancy scales, the 8 item Role-Expectancy scale was identified in both solutions as the third most powerful predictor of strain (i.e., Beta 0.19, sig t 0.0060) and furthermore, was superior to the effect of the coping variable in both analyses. Further, although both models explained an equal 40.83% (adj) of the variance in strain, hierarchical analyses concluded that the model using the Role-Expectancy scale provides the most parsimonious explanation for the variability in symptoms of strain reported by this sample. In other words, the model of best fit shows that expectancies retain their unique effect or predictive power when in the presence of significant common work-role stressors and coping strategies. That is, the results indicate that the nature of self-referrent expectancies (i.e., their anticipated effect) assigned to common work stressors are significantly involved in the assessment of common work stressors and the subsequent effect on the variance in symptoms of strain.

In addition, a further sequence of regression analyses showed that self-referrent expectancies retain their (a) relative independence (i.e., orthogonality) and relative effect in the presence of semantically similar common stressor scales, and (b) their unique or incremental effect when placed in the presence of semantically similar common stressor scales. That is, these analyses and those using the OSI stressor scales show that:

(a) people have both an acute awareness and are able make to make the fine distinction between expectancy and descriptive (i.e., the recognition of commom stressors) sources of stress;

(b) both expectancy (i.e., anticipated effect of work stressors) and descriptive sources of stress each have a significant effect on strain related outcomes;

(c) that people use discrete frames of reference (i.e., bipolar anchors) to both discriminate and evaluate the nature and effect of sources of stress; and

(d) the psychometric properties of common stressor and personal meaning scales may be seen as essentially valid and reliable. The results demonstrate that the scales both discriminate the nature of cognitive constructs and capture the directional intensity of discrete cognitive processes used in the perception (i.e., recognition) and appraisal of common work stressors.

A subsequent statistical comparison of the descriptive and expectancy stressor models confirmed that expectancies add useful information to the explained variance in symptoms of strain; and further, from a priori hierarchical modeling, the theoretical importance of the common stressor and expectancy cognitive processes in the transaction process underlying symptoms of strain

By contrast, the personal valence (i.e., their like or dislike for work demands in terms of "good-bad") of common work stressors did not account for a significant percentage of the variance in strain. A review of the descriptive and correlational data for the valence scales suggests that the associated and cumulative effect of (a) narrow SD's, (b) constrictions in the range of responses to the valence scales, (c) high negative skew coefficients, and (d) low Cronbach Alpha coefficients for internal consistency subsequently reflect as non-significant correlations with strain. In other words, constrictions in the variability of the valence data due to the effect of "errors in measurement" from (a) what seems systematic non-random response bias or the effect of method variance contamination, and (b) random errors in the response to the valence items may act to effectively deflate the correlations with strain (Spector & Brannick, 1995; Tabachnick & Fidell, 1989). As Spector and Brannick make clear . . . "method variance is variance in measurement attributable to features of the specific method rather than the trait or construct of interest" (p. 249). For example, as they point out: "With some methods, such as self-reports, there might be dozens of personality variables that are sources of method variance" (p. 265).

A more instructive insight to the low correlations between the valence scales and strain can, however, be gleaned from a comparison of the frequency graphs for the individual valence and expectancy items (see Appendix A.1.3, Figures A.1 to A.13). As the graphs show, with exception of the response frequencies for variable 1, and variables 9 and 10 in the Role-Responsibility scale, the valence items are all distinctly skewed in the negative direction (i.e., response "bad") and thus are indicative of some underlying systematic response bias in common to the skewed items. Conversely, the response to item 1 (i.e., "Job demands which exceed personal and company resources are") is bimodal in nature and those for the valence Role-Responsibility items (i.e., "being responsible for the performance of others at work is" and " To be responsible for the welfare of others at work is") slightly bimodal and primarily skewed positive or convergent toward the positive response pole "good" of the response scale. By contrast, and without exception, the graphs for the expectancy items indicate that the response frequencies are all distinctly bimodal in nature and skewed toward the negative or "will cause me stress" pole of the response scale. As a result, the bimodal distributions suggest (a) that the expectancy scales effectively discriminate the intensity and direction of the participants expectancies assigned to the anticipated effect of common work demands, and (b) that the participants in this study hold discrete schemas or a complex of subjective views on the expected effect from the exposure to specific common work stressors. Further, if the relationship between the valence and expectancy graphs is seen in theoretical terms, the functional and discrete effect of valence and expectancy schemas in processes of cognition (e.g., the detection, discrimination and evaluation of work stressors) is more explicit. Ajzen and Fishbein (1980) provide some

instructive insight to the functional relationship between valence and expectancy appraisal processes. As they argue, in the "multicomponent" approach to the relationship of attitudes and behaviour . . .

> "attitudes are viewed as complex systems comprising the person's beliefs about the object, (their) feelings toward the object, and (their) action tendencies with respect to the object" (p. 19).

That is, within the bounds of this theoretical approach . . . "attitudes are a function of beliefs" (p. 7). Therefore, with respect to the frequency distribution of the valence responses, the graphs suggest that negative expectancies tend to translate or underpin the intensity of negative valence toward common work stressors.

However, this process of translation would seem to be only a partial explanation for the distinct negative skew of the majority of the valence items, the bimodal distribution of variable 1 and the positive skewness of the valence Role-Responsibility items. For instance, the 0.09 (ns) correlation between the composite valence and expectancy scales indicates, contrary to the distributional data, the relative independence of valence and expectancy appraisal processes in the personal meaning assigned to common work stressors.

Ajzen and Fishbein (1980) however, provide the basis for an explanation to this perplexing issue. As they contend, in the Theory of Reasoned Action, the intention to enact a particular behaviour is in effect determined by the . . . "relative importance of attitudinal and normative components" in processes of cognition and behaviour (p. 84). Specifically, the mediating influence of the normative component reflects the functional intervention of the persons "subjective norm" or their degree of compliance or conformity to the regulatory influence of social pressure (p. 6). That is, a person's subjective norm is in effect a reflection or function of their "normative beliefs" or, if put in more specific terms . . . "the person's beliefs that specific individual's or groups think (they)

should or should not perform (a specific) behaviour" (p. 7). In other words, according to the model, the imbalance or relative importance of the individual's subjective norm may in effect overwhelm or dominate the personal valence toward an intended behaviour. Conversely, it may be the case that that the person's valencies are more dominant than the deterrent of social pressure and thus instead, perform the intended behaviour (Williams & Clarke, 1997). For example. the person may feel that benefits of smoking (i.e., is good for me) outweighs their subjective norm that specific referents (e.g., social norms) believe that smoking is bad for one's health and thus elect to smoke even though they are aware of the possible adverse consequences from smoking (Ajzen & Fishbein, 1980).

The notion of "optimistic bias" provides a basis to understand the role of subjective norms in beliefs about the effect of adverse behaviours (e.g., smoking) on health (Williams & Clarke, 1997). As Williams and Clarke note, optimistic bias is . . . "defined as perceiving oneself as less susceptible than others to unpleasant occurrences" (p. 106). That is, in more precise terms, optimistic bias . . . "refers to favourable perceptions of risk relative to others' risk, rather than to actual risk" (p.106). As the results for their study show, smokers rated the average smoker as 10.0% more likely to experience a major smoking related illness than they themselves. Furthermore, the results found that smokers perceive their friends as less opposed to their smoking, yet on the other hand, recognise . . . "that in the general population, which includes non-smokers, there is a higher percentage of people against smoking" (p. 111). In other words, even though the smokers are acutely aware that smoking is bad for one's health, their subjective beliefs about the risk of smoking effectively overrule their subjective norm on the possible consequences of smoking.

Similarly, with respect to the present study, the underlying effect or the dominance of the subjective or collective norm for the nature of work stressor would seem to explain the pronounced negative skew of the valence variables and the difference in the response distribution from that of the self-referrent expectancy variables. For example, the range and distribution of the response to the Role-Insufficiency expectancy scale suggest that participants have expressed their subjective views concerning the likely effect of role-insufficiency demands on their personal well-being (note: see also the study conducted by Singh & Baumgartel (1966, p. 357) which explored the personal importance of job factors related to the *advancement* and *stability* motivation of airline mechanics; that is, their (a) "needs for advancement" and (b) "needs for security and stability"). Conversely, the polarised negative response to the valence items suggest that the participants have in effect elicited a normative response to the unfavourable nature of these items rather than a subjective response to the item. Similarly, for the Role-Responsibility scale, a majority of participants acknowledge that responsibility will likely cause them stress, yet in near total contradiction, assert that responsibility at work is essentially a good or desired facet of work. Therefore, it would seem that the participants have in effect opted to report the contextual norm for the attractiveness of responsibility at work as the number of negative responses to these items is extremely small. By contrast, the response to variable 1 is seemingly subjective in nature. That is, the participants expectancies acknowledge that this source of qualitative overload will cause them stress; and those for the valence item, that respondents view this item as either a source of demand (i.e., response "bad") or perhaps a source of challenge (i.e., response "good") by this sample.

Furthermore, the skew in the responses to the attitude items is perhaps further confounded by the semantic emphasis of the items in the valence and expectancy scales. The items in the expectancy scale are all self-referrent in that the emphasis of the items is focused by the phrase "will cause me stress". In contrast, the valence items tend to be more job referrent in their emphasis and perhaps partially accounts for the tendency of respondents to elicit a normative response to these items. For instance, the intent of variable 8 in the Role-Insufficiency scale asks participants to appraise whether: " A job that does not recognise or take advantage of work experience is" either "good" or "bad". The item (and several others) is clearly somewhat ambiguous with respect to its intended focus and should be rewritten so as to provide a subjective emphasis.

Thus, taken overall, these results illustrate the importance of placing an increased focus on the personal meaning assigned to common work stressors and the nature of the coping response or method of adjustment to sources of stress. Equally noteworthy, the findings provide some support for the seminal reasoning of Payne et al. (1988) that the measurement of stress can likely be improved by the inclusion of affective (i.e., personal meaning) scales in descriptive (i.e., recognition of stressors) stress inventories.

The study provides also some insight into both the structural relationship underlying cognitive processes and the functional integration of expectancies in the description and personal evaluation of work stressors. The finding that each expectancy scale provides either an additional or, in the case of physical environment demands, an independent contribution to the explained variance in strain when in the presence of the related descriptive scale illustrates the functional involvement of these cognitive variables in the perception and appraisal of work stressors. As James and James (1989) point out, information processing concerned with the "attribution of meaning" reflects the involve-

ment of belief schemas, descriptive meaning and the valuation (i.e., appraisal) of situational stimuli (p.739). The data, however, does not provide any support for (a) the interactive or multiplicative effect of cognitive process from the product of the descriptive and expectancy variables, or (b) the hypothesis that individual differences in personality function to moderate the effect of common stressors and expectancies for common stressors on strain related outcomes. As a result, the regression analyses was unable to identify or explore the moderating effect of individual differences on symptoms of strain. Significant main effects provide a general insight to the prediction of strain, but in and by themselves, they do not reflect the moderating effect of individual differences in stressor to strain related outcomes.

With respect to the results for the dispositional variables Type A behaviour and locus of control, the non-significant results are somewhat contrary to the findings of previous research (Roberson, Cooper, & Williams, 1990); and furthermore, may be seen as inconclusive due to the poor reliability of these scales (see also Williams & Cooper, 1998). As noted in the qualitative results, participants found these scales somewhat difficult to comprehend and perhaps accounts for (a) the constricted range of responses for the Type A (i.e., range = 27) and locus of control (i.e, range = 20) scales; (b) the poor alpha coefficients of 0.60 and 0.40 respectively; and (c) the subsequent non-significant correlations with strain. The alpha coefficients for the scales, however, are not inconsistent with the normative validity data for these scales. The Cronbach alpha values published by Robertson et al. (1990) from their assessment of the scales (i.e., 0.58 and 0.38) are essentially identical to the values for the present study. As these authors conclude, convergent and divergent validity correlations indicate that the Type A scale has acceptable validity. However, the validity evidence for the locus of control

scale is seen as poor. As Robertson et al., further point out: "The questionable value of this scale is also indicated by its low level of reliability (i.e., $\alpha = 0.38$)" from the items used in the scale (p. 36).

By way of summary, then, the data suggests that a linear or additive relationship underpins the functional role of cognitive processes in the recognition (i.e., description) of common work stressors and the subsequent appraisal of common work-role stressors (i.e., personal meaning assigned to common stressors). The data does not, however, show any support for a moderating effect on strain from the interaction of common stressor and expectancy cognitive processes in the recognition and appraisal of common work stressors. Thus, the findings of the study provide some additional support for the theoretical views that both descriptive and personal meaning cognitive processes are both functionally involved in the cognitive assessment of work stressors and strain related outcomes (Payne et al., 1988).

A comparison of the sample mean scores with the published data revealed several significant differences. For instance, the sample mean score for the OSI scale Role-Responsibility is significantly less than the published data and suggests that participants view the facet of responsibility as less of a stressor than the normative group. Further support for this reasoning is evident from the graphical data for the valence of responsibility (see Appendix A.1.3, Fig. A.10). As the graphs indicate, the sample by and large considered the role of responsibility as a predominantly "good" facet of work in the maintenance complex and perhaps accounts for the lower mean score for the sample. As Glowinkowski and Cooper (1985) similarly argue . . . "an individual's appraisal of a situation (i.e., perception of a demand) is blurred by their affective evaluation" of the

demand (p. 212). Seemingly, then, the appraisal of common responsibility stressors as a "good" facet of work, likely acts to decrease the mean score for the recognition of Role-Responsibility common work-role stressors

Conversely, the sample mean score for physical environment stressors is much higher than the published mean score and perhaps reflects the consistent exposure of this sample to changing and adverse environmental conditions during the maintenance of aircraft at the maintenance complex. For example, the biographical data (see Appendix A, Table A.1) indicates that 90% of the sample were required to work some form of regular shiftwork. Furthermore, as evident from the regression analyses, expectancies for physical environment stressors was a significant predictor of strain in the baseline expectancy model and the short form OSI stressor model analyses. In addition, the sample mean score for the Locus of Control scale (42.34) is significantly higher than the published data (33.95) and suggests that this sample has the tendency toward an external locus of control. That is, high scores are indicative of an external locus of control and therefore suggests that the sample perceives that they have only limited control of their work environment.

Furthermore, the sample mean scores for the Physical Strain (18.47) and Composite Strain (71.70) scales are both significantly lower than the published values of 24.05 and 86.26 respectively. The lower value for physical strain would seem to indicate that participants experience less physical symptoms such as sleeping problems, erratic eating habits and feelings of tension than the normative group.

Further, as indicated from the strain scale evaluations (see Appendix A.1.4, Table A.4), the effect of the OSI common stressor scales explains a moderate 17.05% (adj) of the variance in physical strain. In contrast, the effect of the OSI common stressor scales explains a somewhat lower 13.44% (adj) of the variance in interpersonal strain; a much

higher 21.35% (adj) of the variance in psychological strain; and a substantially higher 32.43% (adj) of the variance in vocational strain. In other words, the data indicates that symptoms of psychological and vocational strain are the more relevant indicators of strain for this sample. Further, the lower mean score for the Composite Strain scale is seemingly an additive reflection of the overall lower mean scores for the dimensions of strain. However, the mean score for the OSI Composite Stressor scale and the mean scores for each of the coping dimensions are all substantially lower than the published data and suggest that the effects of common work-role stressors in the maintenance complex are less stressful than those experienced by the reference group.

Data from the strain scale evaluations (see Appendix A.1.4, Table A.4) show that the effect of common work stressors and expectancies for common stressors primarily reflect in the form of vocational strain and to a lesser extent, symptoms of psychological strain for this sample. However, as reported in the results, the efficacy of the Vocational Strain scale may actually be an induced artefact due to a semantic overlap between stressor and strain items. As a result, the relationship of the scale with sources of stress should be treated with caution. Nonetheless, the result does highlight that the fact that the variance explained by a model may be unwittingly inflated by the use of similar items and therefore the validity of the model to explain variance in strain. Furthermore, the strain scale results tend to replicate the findings from previous research which have used the strain sub-scales. Similar to the findings from the present study, Osipow et al. (1985) found that the effect of OSI common stressors and age explain 51.0% of the variance in vocational strain; 49.0% of the variance in psychological strain; and a somewhat lower 32.0% of variance in the physical strain; and 28.0% of the variance in interpersonal strain. Therefore, given these results from both studies, the data suggests

that the Physical and Interpersonal Strain scales are unable to fully capture or account for the nature of strain associated with these dimensions of strain. As a result, the scales are perhaps invalid or poor measures of strain. Similarly, due to the semantic overlap with common stressor items, there are grounds to suggest that the Vocational Strain scale is likewise an invalid measure of strain. Therefore, given the apparent limitations of the Vocational, Physical and Interpersonal Strain scales, it would seem that that the Psychological Strain scale provides the more valid approach to the measurement of strain related outcomes.

Similarly, Osipow and Spokane (1984, 1987) found that the OSI strain scales reduce to a measure of psychological strain. A confirmatory factor analysis of the OSI strain scale items with varimax rotation of the four factor solution, found that the resultant orthogonal structure was dominated by a singe factor labelled exhaustion (i.e., physical and psychological symptoms of strain). The first factor accounts for 56.7% of the cumulative variance and the other three factors (i.e., physical strain, boredom and interpersonal strain), on average, a much lower 7.0% of the common variance. Further, the ratio between the eigen values for the first (i.e., 12.33) and second (i.e., 1.88) factors in the solution is greater than the 6:1 criterion for uni-dimensionality or a general factor in the latent structure of the strain scale items (Bynner, 1988). This indicates that the first principal component accounts for 6.56 times more of the variance in the strain items than the second component; and furthermore, that a single factor best represents the structural composition of the strain items. In effect, the eigen values for the four factor solution indicates that the three lower order factors are essentially redundant measures of strain. Similarly, Osipow and Spokane (1984) argue that strain . . . "might be redefined in a less multi-dimensional way (as) the first factor accounted for more than 56%

of the variance" (p. 80). As a result, they suggest . . . "it may be that (items in the strain scales) should be used as a uni-dimensional measure rather than as separate subscales" for the measurement of strain (p. 80).

The results from the evaluation of the strain scales provide direct support for use a nomothetic and uni-dimensional approach to the measurement of strain (Kasl, 1998). As the results show, the efficacy of the Composite Strain scale was consistent across the regression models used to predict stain. Moreover, the results indicate that the scale was more likely to tap or detect the relative effect of expectancies for common stressors when included in the model. For instance, the Psychological Strain scale accounts for 25.58% (adj) of the variance in strain from the inclusion of the Role-Expectancy scale in the model; in contrast, the Composite Strain scale accounts for an increased 35.51% (adj) of the variance in symptoms of strain.

Furthermore, there is evidence to suggest that items considered redundant in the Vocational Strain scale (i.e., semantic similarity with common stressor items) should remain in the Composite Strain scale. Item correlations with the Composite Strain scale indicate that item similarity does not appear to inflate the correlation with the Composite Strain scale. The carry-over effect from the semantic overlap of stressor and strain items is, it would seem, nullified by the increased number of items in the Composite Strain scale.

In summary, this study has shown that the *personalisation* of a nomothetic descriptive stress inventory enables a significant improvement in the measurement and explanation of the stressor to strain process. As the results show, descriptive (i.e., recognition of common stressors) self-report scales are unable to capture the unique nature of personal meaning cognitive processes involved in the appraisal of common work stres-

sors. As a consequence, the findings of the study provide some support for the inclusion of personal meaning scales in descriptive stress inventories as a means to *tease out* the importance of personal meaning appraisal processes in the transactional relationship between sources of stress and strain (e.g., Payne et al., 1988; Firth-Cozens & Hardy, 1992).

However, as reported in the qualitative results, the addition of personal meaning scales to either nomothetic or context specific stress inventories may in fact tend to increase the likelihood of respondent overload (e.g, cognitive confusion, mental fatigue) in the response to stress inventories. As a result, there is the possibility of a decrease in both the consistency and validity of the responses to constructs in stress inventories. In addition, personal meaning scales present an added difficulty in that, the semantic nature of personal meaning concepts are, it would seem, invariably quite difficult to operationalise (Glowinkowski & Cooper, 1985; Smith, P., 1994). As Smith, P. (1994) likewise argued:

> Shift and nightwork research, in common with other stress research, shows that it is easier to measure frequency and duration of demand stressors, but more difficult to measure their intensity, and far more difficult to measure their meaning (p. 3).

For instance, as evident from the semantic emphasis of the valence items, the formulation of questions which reflect the nature of personal meaning concepts (e.g., valence and expectancy) are tricky if not difficult to write.

Furthermore, the effect of semantic ambiguity may subsequently reflect in the psychometric properties for the scale. For example, the alpha coefficients for the valence and expectancy scales are in the main below those for the descriptive scales. Further, when referenced to the lowest alpha values for the scales, the alpha coefficients for the valence Role-Ambiguity (α = 0.17) and Expectancy Role-Insufficiency (α = 0.51) scales indicate a maximum possible validity of 0.41 and 0.71 for these scales. Perhaps

the more important, the alpha coefficients indicate that an error variance of 83% and 49% respectively underlies the internal consistency of the responses to these scales. In other words, aside from random errors in measurement, it would seem the participants response to the scales was influenced by some underlying source of non-random bias which constricts the response to scale items; or alternatively, they found the items in both scales difficult to interpret.

In summary, this research illustrates the significant involvement of expectancies for common work-role stressors in both the perception (i.e., recognition) of common work stressors and the explanation of the variance in symptoms of strain. However, the functional overlap (i.e., interdependence) of descriptive and personal meaning appraisal processes and associated difficulties, both qualitative and quantitative, with the operationalisation of personal meaning constructs suggests there are perhaps limitations to the inclusion of personal meaning constructs in the self-report measurement of occupational stress.

Future research, therefore, needs to further explore the involvement of valence and expectancy appraisal processes in the perception and evaluation of common work stressors and the difficulties associated with the self-report measurement of personal meaning constructs. In particular, there is the need to triangulate the results for the expectancy scales using another descriptive nomothetic stress inventory (Cox & Ferguson, 1994). For example, in comparison to the frequency approach to measurement used in the OSI stress inventory, the Cooper et al. (1988) occupational stress inventory shifts the focus of measurement to the intensity of common work stressors (i.e., the measurement of common work stressors as a source of pressure).

In addition, it would seem prudent to revise the semantic emphasis of the valence items to reflect a self-referrent focus toward the attractiveness of the valence items. Otherwise, this scale will, it seem, continue to tap the "subjective norm" for the item. Furthermore, the direct effect and moderating role of individual differences in the results for the present study is inconclusive. As the results for this study and previous research show, the psychometric properties of the Cooper et al. (1988) Type A behaviour and Locus of Control scales require further development (Hurrell Jr. et al.,1998; Williams & Cooper, 1998). However, although the results for the present study cast doubts on the importance of personality variables in the stressor to strain process, this result does not annul the need to further explore the role of individual differences in the stress process. For example, dispositions for neuroticism and hardiness cognitive styles are known to predict strain and moderate the transactional relationship between stressors and strain (Cox & Ferguson, 1991). Finally, there is a need to further refine the measurement of strain. As indicated from the results and discussion, a generic or non-specific approach to the measurement of strain is seemingly the more constructive and efficacious route to follow. Factor analyses indicate that symptoms of strain are by and large psychological and physical in nature. Therefore, a composite self-report strain scale formed from occupational measures of psychological and physiological strain would seem the logical route to follow.

Study 2

The Relative Effect and Comparison of Commensurate Common Stressor, Expectancy and Valence Sources of Stress in Study at University[1]

3.2.2.1 Abstract

Using a commensurate approach to measurement and two essentially independent samples (i.e., descriptive sample n = 77 & personal meaning sample n = 72), the principal aim of this two part study was to compare the relative effect of recognition (i.e., common), expectancy and valence sources of stress associated with study at university on the variance in strain. Results from the independent samples using 10 item scales indicate that the effect of common study stressors was greater than the effect of stressor valence and stressor expectancy on the explained variance. The common stressors role-responsibility, role-ambiguity and role-overload explained a moderate 31.30% (adj) of the variance and the expectancies for role-boundary and role-overload, a reduced 14.80% (adj) of the variance in strain. The personal valence of stressors, however, were not significant predictors of strain for the personal meaning sample. Due to the low power of both samples, however, it was not possible to conduct a statistical comparison of the descriptive, expectancy and valence models at a desired power of 0.80 using Z tests of differentials in R^2 based on Fisher's transformation of r to r` as the basis for

[1] This study was conducted by Master of Science (Pass) student Peng Liu and jointly supervised by Assoc. Prof. Peter Smith and the author in the Department of Psychology at the University of Wollongong, NSW, Australia. The research was conducted by Peng Liu in partial fulfilment of the empirical research requirements for the post-graduate Master of Science (Pass) degree offered by the Department of Psychology.

comparison. As a result, the study is unable to conclude that the relative effect of common stressors was superior to the effect of the personal meaning assigned to common stressors on the explained variance in strain.

Results from the descriptive sample using five item short form scales tend to replicate those obtained by the 10 item recognition, expectancy and valence scales. The common stressor scales explained 20.50% (adj) of the variance, the expectancy scales a lower 9.79% (adj) of the variance and the valence scales a low 4.10% (adj) of the variance in strain. Furthermore, the model of best fit explained 22.20% (adj) of the variance from the relative effect of common and expectancy sources of stress. From this model, the expectancy assigned to Role-Ambiguity stressors was found to add 6.40% to the explained variance when placed in the presence of common stressors. The model shows that the personal meaning of stressors contributes useful information to the explained variance in the presence of common stressors. Furthermore, these results are comparable to those found in study one.

The valence of common stressors, however, failed to add useful information to the explained variance in strain. The descriptive data shows that the responses to the valence scales are skewed in the negative direction and may account for the often low reliability of these scales and the non significant correlations with strain. One logical explanation suggests that the negative skewness of the valence responses reflects the underlying effect of either "social" or "contextual" norms for the valence items. The alternative explanation derived from the graphical description of the expectancy and valence responses and correlations for the parallel scales, argues that (a) the expected effect of the stressor and (b) individual differences in dispositions for hardiness underpin

the response to the valence items. The data indicates that a functional linkage or fusion of the expectancy and valence appraisal processes determines the skewness in the responses to the valence items. Directions for future research are discussed.

3.2.2.2 Introduction

Previous research (i.e., study 1) found that the relative effect of descriptive self-report measures of common work stressors was significantly more influential than both the independent and relative effect of self-referrent expectancies (i.e., beliefs concerning the probable effect of work-role stressors) stressors. Conversely and contrary to the principal hypothesis of the study, the participants personal valence (i.e., attitudes) concerning work-role stressors were not significant predictors of strain in any of the regression analyses. The results from study 1, however, may in effect be somewhat misleading or essentially an artefactual underestimate of the explained variance due to a number of methodological deflationary effects.

First, the disproportional 5:1 ratio between the 10 item OSI stressor sub-scales and the generic focus of the two item personal valence and expectancy sub-scales effectively reduced both the sampling capability and the response variability of the personal meaning scales. That is, the combined effect from both the more general emphasis of the two item valence and expectancy scales and the associated constriction in the variability of the personal meaning sub-scales due to the limited response range (i.e., 2 - 14) of the two item scales effectively reduce the SD's for the valence scales (see Tables 3.1 & 3.2). Second, and equally important, it was concluded that the responses to the valence scales were by and large skewed by (a) the effect of subjective norms on the response (i.e., "normative desirability" of the item) to the scale items and (b) the job-referrent emphasis of the valence items (i.e., semantic emphasis) toward the negative or

positive poles of the response scale (Hesketh & Gardiner, 1993, p. 317). As a result, subsequent constrictions in the variability of the self-report data effectively limit or deflate the magnitude of the correlations with strain (Tabachnick & Fidell, 1989).

In addition, the data from an evaluation of the translational efficiency of the OSI strain scales indicated that the variance explained by the OSI descriptive stressor scales (a) may in effect be inflated by the semantic overlap of items in the OSI stressor (i.e., Role-Boundary and Role-Insufficiency scales) and Vocational Strain scale; (b) is not distributed equally across the OSI strain dimensions; and (c) may primarily represent psychological and physiological symptoms of strain. Furthermore, the effect of poor or low reliabilities associated with both the valence (e.g., Role-Ambiguity, $\alpha = 0.17$) and the expectancy (e.g., Role-Insufficiency, $\alpha = 0.51$) scales suggest that the variance explained by the respective models may actually be an underestimate of the true value.

Equally relevant, the non-significant result for the valence scales tends to contradict the findings from a study by Payne et al. (1988) that investigated the correlation between the description (i.e., frequency) of job demands and the affective reaction (i.e., degree of satisfaction with job demands) to job demands within an attitudinal framework. Correlational data from the two samples used in the Payne et al. study indicated that the relationship between work demands and satisfaction with job demands varied widely between positive and negative with a maximum positive correlation of 0.79 and a maximum negative correlation of -0.69 between the descriptive and satisfaction scales. These correlations imply that the degree of dissatisfaction with a job demand is not necessarily contingent on, or positively related to the increasing frequency of a job demand. As the authors state: "Knowing how frequently (job) demands occur does not predict at all how satisfied people are with the situation" even though the job demand appears to be a logical source of dissatisfaction (p. 154). The Payne et al. study found

also that 16 of the 43 items used for both scales tended to be more often seen as a source of job dissatisfaction or job . . . "demands associated with "negative feelings" (p. 154). However, as Payne et al. further point out, although seen as sources of job dissatisfaction, the reaction of the two samples to each of the 16 items was not consistent as the magnitude of the negative or inverse effect size varied between -0.33 and -0.69. That is, the variance in the inverse correlations indicate that adverse job . . . "demands vary in their negativity" for individual people (p. 154). Moreover, given the variability in the degree of dissatisfaction with job demands, the inverse correlations would be expected to reflect in symptoms of strain.

Study 1, however, did not provide any support for the hypothesis that personal valencies toward work demands would account for a significant percentage of the variance in symptoms of strain. This result may, however, as previously discussed, reflect the collective effect of deficiencies in the self-report measurement of valencies toward work-role stressors. As a consequence, this study seeks to further explore (a) the independent and relative effect of personalised stressors on symptoms of strain using commensurate scales with equivalent variability in the range of available responses, (b) the reliability of descriptive and personal meaning stressor scales and (c) the self-report measurement of strain using psychological and physiological dimensions of strain.

The principal aim of this cross-sectional study, therefore, was to identify and compare the predictive power or the ability of commensurate valence, expectancy and descriptive models of stress to explain the variance in symptoms of strain (Caplan, 1987; Caplan et al., 1975; Hesketh & Gardner, 1993; Kahn, 1970; McGrath, 1970a; Pervin, 1968; Rounds, Dawis, & Lofquist, 1987). As Pervin (1968) in a discussion on commensurate measurement notes, any divergence in the nature and emphasis of measurement or the use of divergent units of measurement to measure P-E phenom-

ena . . . "makes comparison of the results (somewhat) difficult" to achieve (p. 65). Therefore, to facilitate or maximise the understanding of P-E relationships and enable a more valid comparison of parallel P-E concepts Pervin argues that . . . "the same units should be used to describe and measure the individual and the environment" (p. 65).

The design and efficacy of commensurate scales of measurement is, however, somewhat more complex than the concept of common or commensurate units implies. As Rounds et al. (1987) argue, three principles of commensurate measurement may be seen to underlie the design, validity and effectiveness of commensurate measurement in P-E models (e.g., stress) of analysis. Thus, in definitive terms:

> Commensurate concepts describe person characteristics and environmental properties that belong to parallel conceptual domains and are logically related to and interdependent on one another.
>
> Commensurate units are those for which intervals of the measurement continuum for the person characteristics are more or less equal to the measurement intervals of the environmental properties.
>
> Commensurate structures consist in parallel and equivalent organization of environment properties and person characteristics (p. 300).

The salient feature underlying the three principles of commensurate measurement, therefore, is one of equivalence. Commensurate concepts referring to the use of scales and items with semantic equivalence for the description of person and environment characteristics; commensurate units referring to the use of equivalent response scales across the scalar dimensions included in the measurement model (i.e., common response format and range of response anchors); and commensurate structures, the use of parallel scales with equivalent or related dimensions in the measurement model (i.e., the use of concepts and scales with equivalent dimensions in the predictor and criterion variables).

Caplan et al., (1975), for example, used commensurate P and E concepts and units of measurement to measure the extent to which (a) the job characteristic was present at work and (b) the amount to which people would prefer the job characteristic to be present in their work to calculate scores of P-E fit. For example, the questions: "How much work load do you have?" and "How much work load would you like to have?" in response to the unidirectional scale 1 (Very Little) to 5 (A Great Deal) typifies the nature of paired commensurate items and response scales used to calculate differential scores of P-E fit from the discrepancy or mismatch between the commensurate items (p. 47).

Drawing on the commensurate approach to measurement used by Caplan et al. (1975) and the significant findings reported by Payne et al. (1988), the present study sought to further explore the self-report measurement of occupational stress using a commensurate approach to measurement. The principal aim of the study was to identify and compare the independent and relative effects or the ability of commensurate valence, expectancy and descriptive stressor scales to account for the variability in measures of psychological and physiological symptoms of strain. The secondary aims of the study were to:

(a) Explore the reliability and determine the statistical relationship (i.e., the independence) of valence, expectancy, and descriptive stressor scales;

(b) Identify and compare the independent and relative efficiency of short form recognition (i.e., descriptive), expectancy and valence stressor scales formed from the factor structure and factor loadings for the OSI stressor scales (see Osipow and Spokane 1983, 1987);

(c) Explore the relative effect of parallel recognition, expectancy and valence stressor scales associated with study at university, that is, these analyses sought to identify the functional involvement of recognition (i.e., descrip tion) and personal meaning cognitive processes in the recognition and evaluation of common stressors;

(d) Explore the relative efficiency of psychological and physiological measures of strain to capture the effect of common, expectancy and valence sources of stress associated with study at university (see Appendix B.2 & B.4).

Therefore, based on (a) the results from study 1, (b) the findings of Payne et al. (1988), (c) the results obtained by Caplan et al. (1975) using a commensurate framework for the measurement of work stressors and (d) the stated aims of the present research, the study sought to test the following hypotheses. It was hypothesised that:

H1 Personal expectations (i.e., self-referrent beliefs) concerning the probable effect of study stressors and personal valencies (i.e., attitudes) toward sources of stress associated with study at university would each explain a significant percentage of the variance in symptoms of strain.

H2 The relative effect of personal valencies and expectancies assigned to common study stressors at university would each contribute significant information to the explained variance in the presence of each other.

H3 Common study stressors (i.e., recognition of stressors common to study at university) would explain significantly more of the variance in strain than the effect of the personal valence and expectancy of stressors associated with study at university.

3.2.2.3 Method

3.2.2.3.1 Participants

Two essentially independent groups of first year psychology students volunteered to take part in the study. Group one, the descriptive sample, comprised 80 students of whom 20 were male and 60 female. The mean age was approximately 23 years and ranged between less than 20 to 50 years. Group two, the personal meaning sample, comprised 74 students of whom 13 were male and 61 female. Their mean age was approximately 23 years and ranged between less than 20 to 50 years. Thus, in total, 154 students took part in the study. Of these, 33 (i.e.,

21%) were male students and 121 (i.e., 79%) female students. The mean age of the participants was approximately 23 years and ranged from less than 20 to 50 years.

3.2.2.3.2 Self-Report Measurement

Commensurate self-report scales were used to measure the nature of common (i.e., descriptive nature) and personal meaning stressors associated with study at university. In addition, self-report measures of strain were used to measure the symptoms of strain recently experienced by the participants during their course of study. Specifically, two independent self-report inventories using (a) commensurate scales for the measurement of stressors (b) an equivalent number of items in each inventory and (c) a composite measure of strain that included physical and psychological dimensions of strain were designed for distribution to the respective independent samples (see Stress at University Survey, Appendix B.5 and B.6).

For the descriptive sample, the inventory was designed to measure (a) the description of stressors common to study at university, (b) the personal meaning of stressors in terms of expectancy and valence and (c) symptoms of strain most recently experienced by the participants (see Stress at University Survey, Appendix B.5). Whereas for the personal meaning sample, the inventory was designed to measure (a) the personal meaning assigned to the expectancies (i.e., self-referrent beliefs) and personal valence (i.e., attitudes) of common study related stressors and (b) symptoms of strain most recently experienced by the participants (see Stress at University Survey, Appendix B.6).

3.2.2.3.2.1 Measurement of Common Study Stressors

The stressor dimensions and items used in the context general Occupational Stress Inventory (OSI) developed by Osipow and Spokane (1983, 1987) provided the items and structural basis for a questionnaire designed to measure the description (i.e., recognition) of common study stressors associated with study at university (see Appendix B.5.1, University Environmental Scale). As evident from the descriptive questionnaire, the OSI items in each stressor dimension were modified to reflect the nature of demands associated with study at university. For instance, the role-overload item "I work under tight deadlines" was reworded to the item "I complete coursework under tight time deadlines". Similarly, the role-boundary item "I have more than one person telling me what to do" was reworded to the item "I have more than one person telling me how to study at university". Furthermore, eight items from the OSI Physical Environment scale were excluded from the questionnaire as they were considered to represent unlikely sources of stress at university. For example, the item "On my job I am exposed to high levels of noise" was seen as an unlikely source of stress at university.

Following the rewording of scale items and the exclusion of eight items from the physical environment scale, a total of 52 items designed to measure the frequency of perceived study-role stressors remained in the descriptive questionnaire. Specifically, 10 item scales designed to measure role-ambiguity, role-boundary, role-insufficiency, role-overload and role-responsibility study demands, and a two item scale to measure physical environment stressors associated with study at university were included in the descriptive questionnaire (see Appendix B.5.1, University Environmental Scale).

Further, to explore the use of alterative response formats other than the more traditional Likert or Semantic Differential methods, the three point response format "Yes" "?" and "No" devised by Smith et al. (1969) to evaluate facets of job satisfaction was adopted to measure the response to stimulus items in the descriptive questionnaire. The anchor "Yes" and a score (3) describing the stimulus item as "Most of the Time"; the anchor "?" and a score (1) describing the stimulus item as "Sometimes"; and the anchor "No" and score (0) describing the item as "Rarely or Never". For example, a response "Most of the Time" to an item and a score (3) indicating that the stressor item is frequently experienced by the person and therefore a possible source of stress.

Furthermore, there is substantive empirical support for the yes/?/no format approach to self-report measurement (McCormick & Ilgen, 1981). Research has found that the psychometric properties of the yes/?/no three point response format is equivalent to the Likert method of self-report measurement (Johnson, Smith, & Tucker, 1982). As Johnson et al. concluded, there is . . . "no real advantage of one response format over the other in terms of internal consistency, stability, and relative independence of the scales over time" (p. 503. For example, the Cronbach alpha coefficients for the JDI sub-scales averaged 0.84 for the three point yes/?/no format and 0.87 for the five point Likert response format. Furthermore, they report that the alpha coefficients for the JDI sub-scales using the yes/?/no format to measure job satisfaction are similar to those reported by previous research.

3.2.2.3.2.2 Measurement of Strain

The 10 item Psychological Strain scale from the OSI inventory (Osipow & Spokane, 1983) was used to measure the extent to which participants have recently experienced psychological strain (See Appendix A.3.7, items 11 - 20). The scale is designed to tap mood related problems such as anxiety, depression and irritability and adjustment difficulties such as sleeping problems and worry about facets of study at university. Results from previous research (e.g., Osipow & Spokane, 1984) and study one, indicate that the scale is both a reliable (i.e., $\alpha = 0.88$) and effective measure of psychological strain. Further, similar to the measurement of common study stressors, a three point yes/?/no response format was used for the measurement of items in the scale.

For the measurement of physical strain, a 20 item scale was formed from (a) the 24 minor health items used by Smith and Bennett (1983) to investigate the effect of shiftworking on factors of health and (b) the 10 item Physical Strain scale used in the OSI inventory (see Appendix A.2.7, items 31 - 40). Specifically, ten items drawn from a factor analysis of the 24 item minor health scale (see Smith and Bennett, 1983) and the 10 item OSI Physical Strain scale were combined to form the 20 item Personal Health scale (see Appendix D.3.6). Consequently, the structure of the Personal Health scale may be seen as essentially multidimensional in nature. As Smith and Bennett similarly concluded from the factor solution (oblique rotation) that emerged from the factor analysis of the 24 health items, the health related items essentially reduce to factors of health representing malaise/neurosis, infections and aches/pains dimensions of health. Further, similar to the measurement of psychological strain, a three point yes/?/no response format was used for the measurement of the response to items in the scale.

In addition, a composite 30 item General Health scale was formed from the items in the Personal Health and Psychological Strain scales (see Appendix B.5.5, General Health Scale). Items in the scale were intermingled as a means to mix the items or evenly distribute distinctions in the nature of health related problems. Further, on the basis of the factor solution for the 24 health items, there is likely a degree of overlap with the items in the Psychological Strain scale or alternatively, redundancy among the items when the Personal Health and Psychological Strain scales are combined to form the composite General Health scale.

3.2.2.3.2.3 Measurement of Personal Meaning

Similar to the descriptive questionnaire, a personal meaning questionnaire comprising commensurate expectancy and valence scales was formed from the stressor items used in the stressor dimensions of the OSI inventory (see Appendix B.6, Stress at University Survey). As evident from the emphasis of the expectancy and valence items in the personal meaning questionnaire (see Appendix B.6), the descriptive OSI stressor items were modified to measure (a) the expectancies of common study stressors (i.e., self-referrent beliefs about the expected effect of stressors) and (b) the personal valence of common stressors (i.e., the attractiveness of study stressors) associated with study at university. For example, the descriptive OSI role-overload item "I work under tight deadlines" was reworded to the role-overload expectancy item "Completing coursework under tight time deadlines will cause me stress"; and the role-over-load valence item "Completing coursework under tight time deadlines is" reflect the subtle shifts in the semantic emphasis of the expectancy and valence stressor items. Moreover, similar to the descriptive questionnaire, eight items from the OSI Physical Environment scale were excluded from the expectancy and valence questionnaires as they were con-

sidered to represent unlikely sources of stress at university. For example, the personal meaning attributed to the OSI descriptive item "On my job I am exposed to high levels of noise" was seen as an unlikely aspect of stress at university.

Further, similar to the descriptive questionnaire, the valence (see Appendix B.6.1, Study Demands Valence Scale) and expectancy (see Appendix B.6.3, Study Demands Expectancy Scale) scales adopted a three point response format and response values (3) (1) and (0) to measure the intensity and direction of the response to the stimulus item. However, in contrast to the three point yes/?/no response format used for the descriptive scale, the expectancy scale adopted the response anchors "Very Likely" (3) "Not Sure" (1) and "Very Unlikely" (0) to measure the response to the stimulus item; and the valence scale, the response anchors "Mostly Good" (0) "Not Sure" (1) and "Mostly Bad" (3) to measure the response to valence items. For both scales, the anchors "Very Likely" and "Mostly Bad" representing the negative or stressful pole of the response scale. That is, a response "Very Likely" and score 3 indicating that the personal meaning attributed to the expectancy stressor item will "very likely" cause the person stress; a response "Mostly Bad" and score 3 indicating that the attributes of the valence item or personal meaning attributed to the valence item is highly unattractive to the person and thereby a possible source of stress.

Following the rewording of scale items and the exclusion of eight items from the physical environment scale, a total of 52 items designed to measure the valence (see Appendix B.6.1, Study Demands Valence Scale) and expectancies (see Appendix B.6.3, Study Demands Expectancy Scale) attributed to study-role stressors remained in each questionnaire. Specifically, 10 item scales designed to measure the personal meaning assigned to role-ambiguity, role-boundary, role-

insufficiency, role-overload and role-responsibility study demands, and a two item scale designed to measure the personal meaning of physical environment demands associated with study at university were included in the expectancy and valence questionnaires.

3.2.2.3.2.4 Short Form Descriptive, Expectancy and Valence Scales

To provide equivalence with the personal meaning inventory (i.e., 52 item expectancy and valence scales), commensurate 6 item expectancy (see Appendix B.5.3, Study Demands Expectancy Scale) and valence (see Appendix B.5.4, Study Demands Valence Scale) scales designed to measure the personal meaning assigned to role-ambiguity, role-boundary, role-insufficiency, role-overload and role-responsibility stressors were included in the descriptive questionnaire (see Appendix B.5). In addition, six item descriptive sub-scales may also be extracted from the 52 item descriptive questionnaire to complement the short form expectancy and valence scales.

The highest factor loadings on the six factor solution (varimax rotation) that resulted from a factor analysis of the 60 OSI stressor items provided the basis for the selection of items used in the short form descriptive, expectancy and valence scales (Osipow & Spokane,1987, Appendix B, p. 21). That is, with the exception of the physical environment factor, the six items with the highest factor loadings on each orthogonal factor were used to form the short form descriptive, expectancy and valence scales. Thus, although serving to balance the commensurate inventories, the short form scales provide the basis by which to further explore the relationship and relative effects of descriptive, expectancy and valence stressors associated with study at university. Further, due to the reduction of the 52

item scales to 50 item scales (see Appendix B.1.1) and the necessity to maintain equivalence across the inventories, the six item short form scales were subsequently reduced to five item scales when used in statistical analyses.

3.2.2.3.3 Design and Materials

This correlational field study required participants to answer a battery of questionnaires in either of two inventories. Moreover, due to the extensive nature of the commensurate inventories (i.e., 148 items in 5 questionnaires) there was an increase in the risk that the responses to the items may be influenced by various sources of response bias. For example, item acquiescence, order and carry-over effects, mental fatigue and/ or boredom with the task are known sources of response bias (Anastasi, 1982; Christensen & Stoup, 1986; Oppenheim, 1966).

In particular, the need to balance the effect of mental fatigue on participants is one issue central to the design of the inventories used in this study and the subsequent validity of the results from the respective inventories. Therefore, to maintain equivalence across the inventories, it was necessary to equalise the mental work load placed on participants.

Furthermore, in an attempt to counteract any tendency to acquiescence the negative or stressful emphasis of expectancy and valence items, items in both scales were reworded to the positive or non-stressful direction. For example, the expectancy item "feeling that my coursework does not fit my abilities and interests will cause me stress" in response to the anchors "Very Likely" "Not Sure" and "Very Unlikely" was reworded to the item "Feeling that my coursework fits my abilities and skills will cause me stress" in an attempt to counteract acquiescence bias. Similarly, the valence item "Not having the resources I need to get my assignments done is" and the response anchors "Mostly Good" "Not Sure"

and "Mostly Bad" was reworded to the item "Having the resources I need to get my assignments done is" in an attempt to reduce any tendency to agree with the item. In subsequent recoding, the scores for non-stressful items were reversed to the stressful direction (i.e., score 3 = 0 and score 0 = 3).

3.2.2.3.4 Procedure

The questionnaires were distributed to participants during lectures and tutorials. Following a brief outline of the study and general nature of the questionnaires, students were advised that they would receive one credit point toward their final grade from their participation in the research. They were then advised that the questionnaire would take around 30 minutes to complete and asked if they would like to participate in the research.

The descriptive and personal meaning questionnaires were evenly mixed prior to their distribution to participants by alternating the sequence of the questionnaires to be handed out to participants. Using this method of distribution, two essentially independent groups were formed to answer either the descriptive or personal meaning questionnaires. Participants were not told which questionnaire they had been given or that they had been assigned to a particular group. They were then asked to complete the questionnaire at home. Completed questionnaires were collected in subsequent tutorials or returned personally to the researchers.

Overall, 241 students volunteered to participate in the study. Of these, 121 were given the descriptive questionnaire and 120, the personal meaning questionnaire. From the descriptive sample, 80 participants returned completed questionnaires (i.e., response rate of 66.12%); and from the personal meaning sample, 74 participants returned completed questionnaires (i.e., response rate of 61.67%).

Thus, from both samples, their was a pooled response rate of 63.90%. When possible, participants were debriefed and the questionnaires checked for missing values in the presence of participants.

3.2.2.4 Results

3.2.2.4.1 Introduction

The results are presented in three sections and reflect the self-report data obtained from two essentially independent samples using a commensurate framework for the measurement of common and personalised stressors associated with study at university. The first section details the results obtained from a 52 item descriptive questionnaire that essentially sought to measure the presence (i.e. descriptive nature) of study demands at university (see Appendix B.5). In addition, to maintain equivalence with the 52 item descriptive scale, 30 item expectancy and valence scales (i.e., total 60 items) were used to measure the personal meaning of study stressors (see Appendix B.5.3 & B.5.4)..

The second section reflects the results obtained from 52 item scales that measure the personal meaning of study demands in terms of (a) their expected effect on the person (i.e., self-referrent probability of the stressor to cause stress) and (b) the personal valence (i.e., attractiveness) of the attributes or qualities of the study stressor to the person (see Appendix B.6.1 & B.6.3).

The third section draws the results obtained from the two quasi samples together and compares the magnitude of the variance explained by the commensurate descriptive, expectancy and valence scales. For each scale, the issue of equivalence between the measurement models takes precedence and where necessary, items are dropped from the respective scales or scales removed from the measurement models in order to maintain balance between the scales and statistical models.

Descriptive statistics, Pearson first-order correlations and a series of backward and hierarchical regression analyses are used to explore the descriptive and personalised data obtained from the quasi samples. In addition, the data is explored for the skewness and variability of the expectancy and valence scales. Finally, Z test comparisons using Fisher's transformation of sample r to r` is used to identify the significance of the difference in the multiple correlation (i.e., R^2) explained by independent regression models (Cohen, 1992; Howell, 1992).

3.2.2.5 Descriptive Sample

3.2.2.5.1 Data Screening and Normality Assumptions

Descriptive statistics, frequency plots and a sequence of multiple regression analyses were used to screen the raw data (n = 80) for any evidence of (a) non-random missing values, (b) violation of the assumptions for normality and linearity and (c) the presence of univariate or multivariate outliers in the data set (Norusis, 1988a; Orr et al., 1991; Tabachnick & Fidell, 1989). From an initial screening of the raw data, one case was removed from the data set due to a sequence of non-random missing values. Missing values were minimal throughout the data set and where necessary were replaced with the mean value for the variable.

Subsequent analyses explored the normality of the variables used in the measurement model and where necessary, univariate outliers and values distant from the general distribution were recoded to values less distant from the next most deviant value in an attempt to improve the normality of the data distribution (Tabachnick & Fidell, 1989). Variables with extreme skew coefficients (see Appendix B.1.1, Table B.1) were

then transformed using either square root, logarithm or inverse transformation techniques in an attempt to reduce the skewness of the distribution to normal limits (Brown & Di Milia, 1995; Dooley et al., 1987; Spencer & Brown, 1986; Stone & Hollenbeck, 1989).[1]

In addition a sequence of regression analyses found that two cases functioned as multivariate outliers in the data set. Both cases, therefore, were eliminated from the case data base. The remaining 77 cases in the data set, however, do not satisfy the minimum requirement for a desired statistical power of 0.80 by which to detect a medium effect size (ES) of 0.15 (i.e., R^2 of 15%) at alpha 0.05 (Cohen, 1992). That is, to detect a significant multiple correlation (i.e., multiple R^2) of medium effect from a model with six independent variables (IV's) there is a requirement for a minimum of 97 cases to ensure an 80% probability of rejecting the null hypothesis (i.e., F test of multiple R) for the regression model. However, previous research (see Table 3.2.1.9) suggests that an ES of approximately 0.30 (i.e., R^2 of 30%) may be expected from the relative effect of the IV's used in the model (Cohen & Cohen, 1983; Howell, 1992). Specifically, for a desired power of 0.80 at alpha 0.05, this value is in effect more closely related to the large ES value of 0.35 expected from 6 independent variables and a required sample size of N = 45. Therefore, on the basis of extrapolation, to detect an expected ES of 0.30 using a desired probability of 0.80 at alpha 0.05, a sample size of N = 77 provides the desired power (i.e., ≥ 0.80) by which to reject the null hypothesis

[1] The skew value divided by the S E of skew calculates a Z score which may then be evaluated for significance at alpha .01 or a more liberal alpha .001 (Tabachnick & Fidell, 1989, p. 72). For example, for the OSI Role-Ambiguity stressor scale, a skew value of 0.97 and SE of skew 0.274, the maximum skewness at alpha .01 (i.e., Z = 2.32) for a normal distribution is 0.636. This study, however, has adopted a more conservative approach to normality and used an alpha level of .023 to determine maximum skewness. Skew coefficients greater than two SE's (i.e., 0.548) were considered to reject the null hypothesis for skewness.

for a regression model with six IV's.[2] Furthermore, the case to IV ratio of 12.8:1 satisfies the requirement for a minimum of five cases to each IV in multiple regression analyses (Tabachnick & Fidell, 1989).

It should be noted, however, the acceptance of an expected large ES and reduced sample size to achieve the power required to reject the null hypothesis for an F test of R^2 is not without some compromise. The large ES in effect increases the probability of incurring an increase in Type 2 errors (Cohen, 1992). That is, because the power of the test is calculated for a given N, alpha and ES, the probability of detecting significant ES's below the given value for ES is significantly reduced. Hence, significant effects in the model may in effect be overlooked or rejected as insignificant due to the limits imposed by the use of a smaller sample size.

From a further screening of the variables used in the descriptive questionnaire (and the necessity to maintain equivalence across the measurement models), item 4 ("I have to take coursework home with me") was dropped from the OSI stressor Role-Overload scale due to a typographical error (i.e., omission of item 4) in the expectancy questionnaire. In addition, to improve the face validity of the Composite Strain scale (i.e., eliminate possible redundancy in the scale), the items "irritability" "Tense/Anxious" Depression" and "Falling/Staying asleep" from the Physical Strain scale were dropped from the scale due to their semantic similarity with items in the Psychological Strain scale.

---

[2] The formula $n^* = L/f^2 + k + 1$ provides the basis for this conclusion (Cohen & Cohen, 1983, p. 117). Substituting the values for L at $\alpha = 0.05$ (13.62), $f^2 = 0.30/0.70 = 0.43$, and $K = 6 + 1$ in the formula, for an expected ES of 0.30, a sample size of 39 provides a desired power of 0.80. By comparison, for a medium ES of 0.15 and desired power = 0.80, the calculated sample size is 85 cases. For this study, the 77 cases in the data set limit the probability of the data set to detect a medium ES to a power of 0.75.

3.2.2.5.2 Descriptive Statistics

Descriptive statistics (n = 77) for the scale means, standard deviations (SD's), scale response range, skewness and internal consistency (i.e., Cronbach alpha coefficients) are shown in Appendix B.1.1; a summary of the variability data for the OSI stressor (short), expectancy (short), valence (short) and comparative variability statistics from study one in Appendix B.1.2; and a graphical summary of the raw data cumulative frequencies for the parallel expectancy and valence scales prior to the removal of outliers and transformations (i.e., n = 79 cases) in Appendix B.1.3.

3.2.2.5.3 Scale Correlations

Pearson zero-order correlations (n = 77) for the OSI stressor scales with the OSI stressor (short), expectancy (short), valence (short), composite scales (i.e., sum of the items in the sub-scales) and dimensions of strain are shown in Table 3.2.2.1; those between the OSI stressor (short), valence (short) and expectancy (short) with physical, psychological and strain composite scales in Table 3.2.2.2; and comparison correlations for the OSI stressor, OSI stressor (short), expectancy (short) and valence (short) original and transformed scales with dimensions of strain in Table 3.2.2.3. The correlations reflect two-tailed tests for significance at $\alpha \leq 0.05$* or 0.01** as indicated.

Significance of Correlations

The desired power of 0.80 required to detect a medium ES of 0.30 at α 0.05 (Two-Tailed) , however, is marginal for sample size n = 77. As the tables for power provided by Cohen (1992) indicate, to detect a medium ES or population r of 0.30 at α 0.05 (Two-Tailed) requires a sample size of n = 85 (see Table 2, p. 158) to achieve a desired power of 0.80. By contrast, the power of a test for sample size n = 76 and medium ES of 0.30 as calculated by Cohen and Cohen (1983, p. 529) is a slightly lower 0.76. In

other words, for this study, with a sample size n = 77 the likelihood of making a Type 2 error is increased to 24.0% and the probability of detecting a significant medium effect from the sample is reduced to 76.0%.

3.2.2.5.3.1 OSI Stressor Scale Correlations

With the exception of the Physical Environment scale, correlations between the OSI stressor scales and the dimensions of strain (see Table 3.2.2.1) are generally low or moderate and significant at either the 0.01 or 0.05 level of significance. In particular, the Role-Boundary scale correlates 0.45** with Physical Strain, 0.42** with Psychological Strain and a slightly higher 0.46**, with the Composite Strain scale at the 0.01 level of significance. The 95% confidence interval for the underlying correlations in the population (i.e., 0.11 to 0. 47, sample size n = 100 and observed correlation of r = 0.3) verify the significance of the computed correlations (Skinner, 1984).

OSI Interscale Correlations

The correlations between the OSI common stressor scales fall within two distinct groups of significant and not significant correlations. Those between the ambiguity, boundary and insufficiency scales are moderate in nature and those between the overload, responsibility and physical environment scales are mainly not significant. For example, the Role-Boundary scale correlates a moderate 0.54** with the Role-Ambiguity scale and a slightly higher 0.59** with the Role Insufficiency scale. Further, these correlations suggest that the six OSI common stressor dimensions may in effect reduce to two independent stressor dimensions. One essentially psychological in nature and the other a reflection of contextual and environmental stressors. Two of the stressor dimensions in each group, therefore, may be considered redundant.

Table 3.2.2.1 Correlations: Descriptive Sample - OSI Stressor Scales With OSI Stressor (Short), Valence (Short), Expectancy (Short) and Strain Scales

Scale	1	2	3	4	5	6	7
Stressor (OSI)							
1. Role-Ambiguity	----						
2. Role-Boundary	.54**	----					
3. Role-Insufficiency	.49**	.59**	----				
4. Role-Overload	.27*	.30*	.28*	----			
5. Role Responsibility	.04	.25*	.24*	.10	----		
6. Physical Environ	.16	.16	.28*	.17	.01	----	
7. Composite#	.73**	.80**	.79**	.60**	.43**	.24*	----
Stressor OSI (Short)							
8. Role-Ambiguity	.89**	.48**	.48**	.24*	-.03	.22	.66**
9. Role-Boundary	.37**	.86**	.45**	.21	.38**	.12	.66**
10. Role-Insufficiency	.49**	.54**	.93**	.25*	.19	.32**	.71**
11. Role-Overload	.11	.23*	.16	.91**	.08	.18	.46**
12. Role Responsibility	.12	.17	.20	.09	.85**	-.09	.38**
13. Composite#	.66**	.75**	.73**	.61**	.45**	.26*	.95**
Valence (Short)							
14. Role-Ambiguity	-.13	-.24*	.08	.03	.00	.13	-.08
15. Role-Boundary	-.13	-.06	-.03	.07	.03	.04	-.05
16. Role-Insufficiency	-.15	-.20	.03	.04	-.28*	.15	-.16
17. Role-Overload	.12	-.00	.15	.12	-.17	.01	.09
18. Role Responsibility	-.09	-.15	-.11	.07	-.17	-.06	-.13
19. Composite#	-.09	-.18	.03	.11	-.16	.06	-.08
Expectancy (Short)							
20. Role-Ambiguity	-.24*	-.23*	-.04	-.29**	-.30**	.02	-.33**
21. Role-Boundary	.01	.25*	.13	.14	.13	.03	.19
22. Role-Insufficiency	-.13	-.13	.12	.13	.03	.08	-.01
23. Role-Overload	-.02	-.01	.07	.23*	-.13	-.08	.05
24. Role Responsibility	.10	.12	.14	.15	-.03	.09	.15
25. Composite#	-.08	.04	.13	.12	-.03	.04	.05
Strain							
26. Physical	.41**	.45**	.27*	.37**	.35**	.08	.55**
27. Psychological	.37**	.42**	.30**	.39**	.28*	.33**	.53**
28. Composite Strain#	.41**	.46**	.30**	.40**	.34**	.19	.57**

Note: n = 77; * $p \leq .05$, ** $p \leq .01$ (two-tail); #Comp: Composite scale from sum of sub-scales

Further, correlations between the OSI stressor and the OSI stressor (short) scales indicate a high correspondence with the parent OSI scales; and similar to those between to parent OSI scales, tend to fall within two groupings. For instance, the Role-

Insufficiency scales correlate 0.93**, the Role-Responsibility scales 0.85** and the composite scales 0.94**. Consequently, the OSI Stressor (short) scales may be seen as valid and parallel representations of the parallel OSI scales.

OSI, Expectancy and Valence Scale Correlations

The correlations between the OSI stressor, valence and expectancy scales are by and large not significant. For example, the Composite OSI scale correlates a very low and inverse -0.08 (ns) with the Composite Valence scale and likewise, a very low and positive 0.05 (ns) with the Composite Expectancy scale. Therefore, On this basis of these correlations, it is reasonable to conclude that the OSI stressor scales and the expectancy/valence scales are essentially independent in nature.

3.2.2.5.3.2 Short Form Scale Correlations

With respect to the OSI short form scales (see Table 3.2.2.2), although low the Role-Ambiguity and Role-Boundary scales have the highest correlations with the Physical Strain (0.31** & 0.39**), Psychological Strain (0.29** & 0.31**) and Composite Strain (0.32** & 0.39**) scales. Conversely, although in general significant, those for the insufficiency, overload and responsibility scales correlate on average a slightly lower 0.26* with the Physical Strain scale; 0.26* with the Psychological Strain scale and 0.27* with the Composite Strain scale. Moreover, similar to the OSI stressor scales, the correlations between the short form OSI stressor scales tend to fall within two independent groups. The ambiguity, boundary and insufficiency scales forming one group with significant correlations; the overload and responsibility scales forming a second group with non-significant relationships.

Valence Scale Correlations

For the valence (short) scales, none of the scales reflect a significant and positive relationship with any of the strain dimensions. With the exception of the Role-Responsibility scale, the significant negative skewness of the scales may account for the non-significant correlations with strain. Seemingly, the response to these scales is directional (i.e., a nominal "good" or "bad" response to the items) rather than an extent (i.e., interval or wide range of responses) response to the scale items and thus may explain the non-significant correlations with strain. By contrast, the response distribution for the Role-Responsibility scale is normally distributed (see Appendix B.1.1, Table B.1) and suggests an extent response to the items in this scale. In addition, the internal consistency (i.e., $\alpha = 0.80$) of scale is moderate and further indicates the extent nature of the responses to this scale.

Further, similar to the OSI (short) scales, the correlations between the valence scales are mainly significant and indicate that the correlations fall within two noticeable but slightly different groups. Those between the ambiguity, boundary, insufficiency and overload scales forming one group of significant correlations and the responsibility scale, a second independent group.

Furthermore, the correlations indicate a low to moderate overlap between the valence scales. For instance, the Role-Boundary scale correlates on average 0.45** with each valence scale and the valence Role-Overload scale, on average 0.43** with each valence scale. Thus, considering the low to moderate overlap of the valence scales, it is reasonable to conclude that the valence scales do not represent independent dimensions of personal valence; that is, they indicate the presence of redundancy within the valence scales.

Table 3.2.2.2 Correlations: Descriptive Sample - OSI Stressor (Short), Valence (Short), Expectancy (Short) and Strain Scales

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Stressor OSI (Short)																				
1. Role-Ambiguity	----																			
2. Role-Boundary	.29**	----																		
3. Role-Insufficiency	.47**	.40**	----																	
4. Role-Overload	.10	.18	.16	----																
5. Role Responsibility	.05	.27*	.13	.07	----															
6. Composite OSI (Short)#	.64**	.68**	.71**	.54**	.46**	----														
Valence (Short)																				
7. Role-Ambiguity	-.11	-.26*	.05	.06	.05	-.06	----													
8. Role-Boundary	-.09	-.06	-.00	.16	-.03	-.01	.45**	----												
9. Role-Insufficiency	-.06	-.28*	.01	.10	-.22	-.15	.54**	.39**	----											
10. Role-Overload	.14	-.19	.17	.08	-.14	.03	.29**	.39**	.35**	----										
11. Role Responsibility	-.10	-.17	-.08	.02	-.28*	-.19	.01	.30**	.09	.42**	----									
12. Composite Valence#	-.06	-.27*	.04	.12	-.17	-.10	.64**	.74**	.66**	.72**	.61**	----								
Expectancy (Short)																				
13. Role-Ambiguity	-.12	-.21	-.06	-.26*	-.33**	-.32*	.43**	.24*	.42**	.22	.03	.36**	----							
14. Role-Boundary	-.03	.27	.15	.19	.07	.21	.14	.36**	.06	-.02	.05	.17	-.06	----						
15. Role-Insufficiency	-.12	-.11	.07	.11	-.09	-.04	.38**	.37**	.39**	.30**	.29*	.49**	.16	.39**	----					
16. Role-Overload	-.05	-.02	.10	.34**	-.19	.08	-.06	.12	.13	.21	-.00	.09	-.07	.27*	.19	----				
17. Role Responsibility	.07	.14	.16	.22	.06	.22	.01	.17	-.12	.02	.03	.03	-.05	.44**	.06	.14	----			
18. Composite Expectancy#	-.07	.08	.13	.22	-.09	.10	.29*	.45**	.24*	.19	.11	.35**	.29**	.79**	.59**	.46**	.63**	----		
Strain																				
19. Physical	.31**	.39**	.24*	.25*	.29*	.48**	-.20	-.13	-.21	.12	.06	-.09	-.33**	.20	-.01	.01	.08	.02	----	
20. Psychological	.29**	.31**	.26*	.31**	.22	.47**	-.06	-.07	-.11	.16	.06	.02	-.32**	.22	.03	.02	.17	.06	.76**	----
21. Composite Strain#	.32**	.39**	.26*	.29*	.27*	.50**	-.17	-.14	-.17	.13	.06	-.06	-.33**	.21	-.00	.02	.11	.04	.97**	.89**

Note: n = 77; *p ≤ .05, **p ≤ .01 (Two-Tail); #Comp: Composite Scale From Sum of Sub-Scales

Expectancy Scale Correlations

With the exception of the Role-Ambiguity, correlations between the expectancy and strain scales are not significant . It correlates an inverse -0.33** with the Physical Strain scale, -0.32** with the Psychological Strain scale and -0.33** with the Composite Strain scale.[4] Further, with the exception of the Role-Boundary scale which correlates 0.39** with Role-Insufficiency; a lower 0.27* with Role-Overload; and a moderate 0.44** with the Role-Responsibility scale, the correlations between the expectancy scales are either low or generally not significant. Thus, in effect, there is little evidence to suggest that the correlations between the scales fall within two polarised groups. Hence, based on the low and generally non-significant correlations, it is reasonable to conclude that the expectancy scales are essentially independent in nature.

Interscale Correlations

The correlations between the OSI stressor (short), valence and expectancy scales are by and large not significant. For example, the Composite OSI scale correlates an inverse -0.10 (ns) with the Composite Valence scale and a positive 0.10 (ns) with the Composite Expectancy scale. As a result, the recognition of stressors and the personal meaning assigned to stressors may be seen as essentially independent cognitive processes. How-

[4] Note, the negative correlations with strain for the valence Role-Ambiguity, valence Role-Insufficiency and expectancy Role-Ambiguity scales reflect the recoding of positive items to maintain consistency with the "Mostly Bad" and "Very Likely" (i.e., stressful) poles of the response scales. For instance, for the expectancy item "Knowing where to begin new assignments when given to me will cause me stress", a response of "3" (i.e., very likely) was recoded to a response "0". An item analysis of the scale items indicates that the responses to each item correspond to the "non-stressful" emphasis of the respective items. However, due to the large number of positive items in each of the above scales, the collective effect from the reversal of the positive items changes the conceptual orientation of the scale items from "stressful" to "non-stressful" with hence, the resultant negative correlations with dimensions of strain. See also Cordery & Sevastos (1993) for a more recent evaluation of negatively and positively worded items in self-report measures.

ever, although small, significant correlations between the scales suggest that the recognition and personal meaning of stressors may in effect function as interdependent information processes (i.e., the encoding and decoding of stimulus information in terms of recognition, interpretation and response) which underpin the recognition, appraisal and response to common stressors.

Expectancy and Valence Scale Correlations

Consistent with theoretical views on the relationship of expectancy (i.e, self-referrent beliefs) and valence (i.e, attitudes) appraisal processes, there are low but significant correlations between the valence and expectancy scales (Ajzen & Fishbein, 1980; Vroom, 1964). The Valence Role-Ambiguity scale correlates a moderate 0.43** with the Expectancy Role-Ambiguity scale; the Role-Boundary scale 0.36* with Expectancy Role-Boundary scale; the Role-Insufficiency scale 0.39** with the Expectancy Role-Insufficiency scale; the Role-overload scale 0.30** with Expectancy Role-Insufficiency; and the Composite Valence scale 0.35** with the Expectancy Composite scale. Equally interesting, the expectancy Role-Insufficiency scale correlates on average .37** with each valence scale. Therefore, on the basis of these correlations, it appears that either (a) the expectancy Role-Insufficiency scale is a redundant scale; or alternatively (b) that the expected effects of Role-Insufficiency common stressors (i.e., the inability of coursework to satisfy the needs and expectations of students) may function as a frame of reference for the valence scales. That is, if the personal meaning attributed to one's course of study is stressful (i.e. very likely to cause them stress) then the stressful nature of role-insufficiency demands may well be reflected in the valence of the other stressor dimensions. Nonetheless, when seen in terms of independence, the significant, 0.35** correlation between the composite scales is reasonably weak. It explains a low 12.25% of the variance between the va-

lence and expectancy scales. As a result, it may be concluded that the valence and expectancy scales measure related but different appraisal processes or dimensions of personal meaning.

Strain Scale Correlations

Correlations between the Physical, Psychological and Composite Strain scales are all high and indicate the existence of both multicollinearity (i.e., correlations ≥ 0.90) and singularity (i.e., correlations approaching 1.0) among the strain scales (Tabachnick &. Fidell, 1989). Specifically, the Physical scale correlates 0.76** and 0.97** with the Psychological and Composite scales; and the Psychological scale 0.89** with the Composite scale. The correlations indicate a high degree of redundancy among the strain scales. As Tabachnick and Fidell note, the existence of bivariate correlations greater than 0.70 indicate that one of the variables may need to be dropped from the analysis; similarly, for the existence of singularity, one of the variables should be dropped from the model. The high correspondence between the scales indicates that the Physical and Psychological Strain scales (0.76**) are relatively independent and thereby tapping discrete dimensions of strain; and the singularity with the Composite scale (0.97** & 0.89**) indicating (a) the uni-dimensionality of the Composite scale, (b) that either the Physical or Psychological scales or alternatively, the Composite Strain scale should be dropped from the model, or (c) retained in the model for comparison purposes.

3.2.2.5.3.3 Comparison of Original and Transformed Scales

A comparison of the correlations achieved from the transformation of stressor and strain scales with skewed distributions greater than two SE's of skew (i.e., 0.548) is shown in Table 3.2.2.3.

Table 3.2.2.3
Correlation Comparison: Raw and Transformed OSI Stressor, OSI Stressor (Short), Expectancy (Short), Valence (Short) Scales With Strain and Transformed Strain Scales

Transformed Stressor Scales	Strain Scales							
	Physical		Psychological		Sqrt Psychological		Strain Composite	
	Orig#	Trans#	Orig	Trans	Orig	Trans	Orig	Trans
Stressor (OSI)								
1. Role-Ambiguity	.41**	.39**	.37**	.35**	.37**	.35**	.41**	.38**
2. Role-Boundary	.45**	.44**	.42**	.41**	.42**	.41**	.46**	.45**
3. Role Responsibility	.35**	.35**	.28*	.29*	.27*	.28*	.34**	.35**
Stressor OSI (Short)								
4. Role-Ambiguity	.31**	.27*	.29**	.27*	.30**	.27*	.32**	.28*
5. Role-Boundary	.39**	.42**	.31**	.35**	.31**	.35**	.39**	.42**
6. Role-Insufficiency	.23*	.24*	.26*	.27*	.25*	.26*	.26*	.27*
7. Role Responsibility	.29*	.31**	.21	.25*	.22	.25*	.27*	.29*
Expectancy (Short)								
8. Role-Overload	.01	-.08	.02	-.11	.03	-.12	.02	-.10
Valence (Short)								
9. Role-Ambiguity	-.20	-.26*	-.06	-.09	-.07	-.10	-.17	-.23*
10. Role-Boundary	-.13	.12	-.07	.08	-.06	.06	-.14	.13
11. Role-Insufficiency	-.21	-.24*	-.11	-.16	-.11	-.16	-.17	-.21
12. Role-Overload	.12	.16	.16	.17	.18	.18	.13	.16
13. Composite	-.09	.10	.02	-.00	.04	-.02	-.06	.07

Note: n = 77; * p ≤ .05, **p ≤ .01 (two-tail); Orig# - Correlation With Original Stressor Scale; Trans# - Correlation With Transformed Stressor Scale

As the table indicates, the transformation of skewed scales does not necessarily substantially improve the correlation between stressor and strain scales. For instance, the correlations for the stressor OSI scales Role-Ambiguity and Role-Boundary with the Composite Strain scale reduce from 0.41** and 0.46** to 0.38** and 0.45** respectively. Conversely, the correlations for the OSI stressor (short) scale Role-Boundary improves from 0.39** to 0.42** for the Physical Strain scale; 0.31** to 0.35** for the Psychological Strain scale; 0.31** to 0.35** for the transformed Psychological Strain scale; and from 0.39** to 0.42** for the Composite Strain scale.

In subsequent regression analyses, when applicable to the model, the transformed stressor scale replaced the original scale in regression models that sought to explore the relative effects and functional relationship of recognition and personalised stressors on strain related outcomes.

3.2.2.5.4 Regression Analyses

The results from a series of backward and hierarchical regression models which explore the relative effects of the OSI and OSI (short), expectancy (short) and Valence (short) original and transformed (i.e., the necessity to reduce the effect of univariate outliers in regression models) stressor scales on the Composite Strain scale are shown in Tables 3.2.2.4 through 3.2.2.9. Table 3.2.2.4 shows the results from analyses that explored the relative effects of the OSI stressor scales and transformed OSI stressor scales on strain; Table 3.2.2.5 the results from baseline models that explored the effect of the original and transformed OSI (short), expectancy (short) and valence (short) scales on strain; Table 3.2.2.6 a series of backward regressions that explore the relative effects or functional relationship (i.e., their linear involvement in the recognition and personal meaning of stressors) of commensurate common (i.e., descriptive), expectancy and valence sources of stress on strain; and Tables 3.2.2.7 to 3.2.2.9, a series of backward regression and forced entry (i.e., hierarchical) models that sought to identify (a) the model of best fit or the most parsimonious model from the relative effect of significant OSI (short), expectancy (short) and valence (short) stressor scales identified in baseline regression models and (b) the unique or incremental effect of personal meaning stressor scales when placed in the presence of descriptive stressor scales. That is, these analyses sought to identify the extent to which significant predictors of strain contribute useful and unique information to the explained variance when in the presence of each other.

For each model, an alpha pout at $\alpha \geq 0.051$ (Two Tailed) level of significance is used to (a) effect the removal of an IV from the regression model or (b) interpret the data in the equation for hierarchical models.

3.2.2.5.4.1 OSI Stressor Scale Analyses

For the descriptive OSI stressor model (i.e., recognition of common stressors) the results for the final equations (see Table 3.2.2.4) indicate that the original and transformed stressor scales contribute useful information to the explained variance in strain. Specifically, for the original OSI scales model, the cumulative effect from the Role-Ambiguity, Role-Responsibility and Role-Overload scales explained a moderate 32.28% (adj) of the variance in the Composite Strain scale. By contrast, for the model using transformed scales, the Role-Responsibility and Role-Ambiguity transformed scales and the original OSI Role-Overload scale explained a slightly reduced 31.34% (adj) of the variance in strain. As the data for the final equation indicates, from the effect of data transformation, the Role-Responsibility scale (t = 3.184, signif t = 0.0017) displaced the Role-Ambiguity scale (t = 3.170, signif t = 0.0021) as the most powerful predictor of strain in the model.

Table 3.2.2.4
Backward Regression: Composite Strain on OSI Stressor Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
OSI Stressor Scales	Role-Ambiguity			.3187	3.252	.0017
	Role-Responsibility	34.89%	32.28%	.3023	3.185	.0021
	Role-Overload			.2871	2.918	.0047
Mult R=.5907; SE 12.6086; F(3,73) 13.0413, p. 0000						
OSI Stressor Transformed Scales	Role-Responsibility#			.3051	3.184	.0021
	Role-Ambiguity#	34.04%	31.34%	.3102	3.170	.0022
	Role-Overload			.2892	2.932	.0045
Mult R=.5835; SE 12.6902; F(3,73) 12.5621, p. 0000						

Note: pout ≥ .051 (two-tail); #Transformed Scale

3.2.2.5.4.2 Baseline Model Analyses (Short Form Scales)

Results from the series of baseline analyses using short form original and transformed OSI stressor, expectancy and valence scales are shown in Table 3.2.2.5. In short, the data shows that OSI common stressor, expectancy and valence sources of stress contribute useful information to the explained variance in composite strain. As the table indicates, the short form OSI stressor scales Role-Boundary and Role-Overload explain a moderate 17.64% (adj) of the variance in strain. By contrast, the results for the OSI transformed model show the effect of the transformed Role-Boundary scale and the original Role-Overload scale explain a substantially higher 22.63% (20.54% adj) of the variance in strain.

The expectancy models, however, explain a substantially lower 9.79% (adj) of the variance in strain. For both expectancy models, the original Role-Ambiguity scale was the only significant predictor of strain in both regression models.

The results for both valence models are in general poor and reflect the non significant correlations with the Composite Strain scale. The effect of the original valence scales on strain was not significant. As shown by the data for the final equation, the Role-Ambiguity scale was the most significant predictor of strain (t = -1.517, signif t = 0.1334) in the model. While for the transformed scales model, the Role-Ambiguity transformed scale (t = -2.069, signif t = 0.0420) was the only significant predictor in the model which explained a rather low 5.40% (4.14% adj) of the variance in strain.

Table 3.2.2.5
Backward Regression: Baseline Models (Short Form Scales) - Composite Strain on OSI Stressor (Short), Expectancy (Short), Valence (Short) Original and Transformed Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
OSI Stressor (Short Form)	Role-Boundary	19.81%	17.64%	.3463	3.273	.0016
	Role-Overload			.2246	2.123	.0371
Mult R=.4450; SE 13.8986; F(2,74) 9.1383 , p .0003						
OSI (Short) (Transformed)	Role-Boundary#	22.63%	20.54%	.3854	3.715	.0004
	Role-Overload			.2213	2.133	.0363
Mult R=.4757; SE 13.6520; F(2,72) 10.8201, p .0001						
Expectancy	Role-Ambiguity	10.97%	9.79%	-.3313	-3.041	.0033
Mult R=.3313; SE 14.5460; F(1,75) 9.2450, p.0033						
Expectancy (Transformed)	Role-Ambiguity	10.97%	9.79%	-.3313	-3.041	.0033
Mult R=.3313; SE 14.5460; F(1,75) 9.2450, p.0033						
Valence	Role-Ambiguity	00.00%	00.00%	-.1726	-1.517	.1334
	Role-Insufficiency			-.1704	-1.498	.1384
	Role-Boundary			-.1357	-1.186	.2392
	Role-Overload			.1279	1.117	.2677
	Role-Responsibility			.0598	.519	.6056
Mult R=.0000; SE 15.3147; F(0,76) F is Undefined						
Valence (Transformed)	Role-Ambiguity#	5.40%	4.14%	-.2324	-2.069	.0420
Mult R=.2324; SE 14.9944; F(1,75) 4.2822, p. 0420						

Note: #Transformed Variable

3.2.2.5.4.3 Statistical Comparison of the Descriptive, Expectancy and Valence Short Scale Models

A statistical comparison of the transformed scale models using a Z test based on Fisher's transformation of r to a normal distribution (r`) was used to test the difference between the multiple R coefficients for the respective models.[5] Taken at face value, the difference in $R^2$ between the descriptive/expectancy models (i.e., 11.66% or r` = 0.174), descriptive/ valence models (i.e., 17.23% or r` = 0.283) and the expectancy/valence models (i.e., 5.57% or r`=0.109) would appear to reflect significant differences. However, when tested against Z at α 0.10 (Two-Tailed) using a standard error of 0.1643 derived from N1 and N2 (i.e., required $Z \geq 1.65$ to reject the null hypothesis that the models explain an equal percentage of the variance in strain) and sample size n = 77, only the difference in R^2 between the descriptive and valence scales (i.e., Z = 1.7225) is significant at the 0.10 level of significance. The Z scores for the descriptive/expectancy (i.e., Z = 1.0608) and expectancy/valence (i.e., Z = 0.6634) R^2 differentials both fail to reject the null hypothesis that the models explain an equal amount of the variance in strain.

Therefore, given the non-significant Z test results, it would seem reasonable to conclude that, for this sample, there is no significant difference between the effect of either recognition and expectancy or expectancy and valence sources of stress on the variance in strain. That is, on the basis of the r` differentials, it cannot be concluded with any

[5] The significance of the difference between two independent r's may be determined using a Z test based on the formula: Z = r`1 - r`2/sqrt 1/N1-3 + 1/N2-3 (Cohen & Cohen, 1983, p. 54; Howell, 1992, p. 251). For this calculation, the OSI, expectancy and valence models are assumed to represent independent samples. That is, although obtained from the same sample, the Multiple R's for the models are considered to be independent coefficients (Cohen, 1992).

confidence that either the recognition (i.e., description) of stressors or the expectancy assigned to stressors is the dominant or fundamental dimension of cognition underlying the transactional relationship between stressors and strain.

This result, however, is in effect invalid as it fails to account for the importance of sample size in Z tests of R^2 differentials. By substitution, it can be shown that sample sizes for N1 and N2 of N = 180 or alternatively an R^2 differential of around 18.0% is required at α 0.10 for a Two-Tailed test (i.e., $Z \geq 1.65$) to detect a significant difference in the variance explained by the models. While for a Z test at α 0.05 Two-Tailed (i.e., $Z \geq 1.96$), a sample size of N = 250 for N1 and N2 or alternatively, an R^2 differential of approximately 23% is required to detect a significant difference between the models. For a sample size of N = 77 and a desired power of 0.80 at α .05 (Two Tailed), the sample size fails to ensure the required power for the Z test. As Cohen (1992) notes, for a medium ES of r` = 0.30 (note: the highest r` for this sample is 0.283) at α 0.05 (Two Tailed), a sample size of N = 177 is required to achieve a desired power of 0.80 (see Table 2, p. 158). Therefore, given the effect of sample size on Z tests of R^2 differentials, the Z test statistics at α 0.10 (Two-Tailed) for the present study are in effect invalid. Due to inadequate power, it is not valid to conclude that significant differences in R^2 exist between the descriptive, expectancy and valence measurement models.

3.2.2.5.4.4 Commensurate Scale Analyses

The results from a series of backward regressions that explored the functional relationship of parallel descriptive, expectancy and valence stressors with strain are shown in Table 3.2.2.6. As shown, for each model, the OSI Stressor (short) scale contributes useful information to the explained variance either by itself or in the case of the ambiguity and insufficiency models, in the presence of the related expectancy or valence scale. In particular, the OSI Role-Boundary scale explains 16.78% (adj) of the variance following

the removal of the expectancy and valence scales from the model; the ambiguity model 13.88% (adj) of the variance from the relative effect of the expectancy and OSI scales; and the insufficiency model, 8.19% (adj) of variance from the relative contribution of the parallel OSI and valence scales. Consequently, it can be concluded that for this sample, by and large the recognition and subsequent effect of parallel stressors on strain is primarily dependent on the descriptive attributes of common stressors, that is, the perceived frequency, duration or intensity of the stressor.

Table 3.2.2.6 Backward Regression: Commensurate Scale Analyses - Composite Strain on Commensurate OSI Stressor (Short), Expectancy (Short) and Valence (Short) Stressor Scales

Model	Final Equation	Rsq	Rsq (Adj)	Beta	T	Sig T
Role-Ambiguity	Expect Role-Ambiguity	16.15%	13.88%	-.2994	-2.699	.0086
	OSI Role-Ambiguity#			.2410	2.136	.0360
Mult R=.4018; SE 14.2123; F(2,74) 71241, p .0015						
Role-Boundary	OSI Role-Boundary#	17.87%	16.78%	.4227	4.040	.0001
Mult R=.4227; SE 13.9713; F(1,75) 16.3188, p .0001						
Role-Insufficiency	OSI Role-Insufficiency	10.61%	8.19%	.2588	2.305	.0240
	Valence Role-Insufficiency			-.2030	1.783	.0787
Mult R=.3257; SE 14.6739; F(2,74) 4.3915, p .0158						
Role-Overload	OSI Role-Overload	8.20%	7.00%	.2863	2.588	.0116
Mult R=.2863; SE 14.7712; F(1,75) 6.6963, p .0116						
Role-Responsibility	OSI Role-Responsibility#	8.37%	7.12%	.2893	2.617	.0107
Mult R=.2893; SE 14.7573; F(1,75) 6.8493, p .0107						

Note: pout, SPSS Default (.10); #Transformed Variable

However, as further evident from the table, the expectancy scale in the ambiguity model has by far the dominant role in the expectancy model (t = -2.699, signif t = 0.0086). Similarly, although only approaching the 0.05 level of significance, the valence scale in the insufficiency model has a significant but seemingly subordinate role in the recognition and personal meaning of role-insufficiency stressors associated with study at university. Consequently, based on these results, there is evidence to suggest that the personal meaning assigned to stressors is functionally involved in the recognition and appraisal of common stressors.

3.2.2.5.4.5 Model of Best Fit (Short Form Scales)

A final backward regression was used to identify the model of best fit from the significant predictors of strain identified in the OSI stressor (short), expectancy (short) and valence (short) baseline models (see Table 3.2.2.5) when in the presence of each other. That is, this analysis sought to identify the model which provides the most parsimonious explanation for the variability in symptoms of strain reported by this sample. In addition, hierarchical modelling (see Table 3.2.2.8) was used to test (a) the significance of the increased variance explained by the model (i.e., the incremental increase beyond that explained by the OSI stressor (short) baseline model) and (b) identify the unique contribution of the significant predictors identified in the model of best fit (see Table 3.2.2.7).

As the data in Table 3.2.2.7 shows, the descriptive scale Role-Boundary (t = 3.602, signif t = 0.006) and the expectancy scale Role-Ambiguity (t = -2.578, signif t = 0.0147) were the only scales to remain in the model which explained an increased 24.25% (22.21% adj) of the variance in strain. The inclusion of the expectancy stressors in the presence of the OSI stressors added an additional 1.62% (1.67% adj) to the variance explained by the OSI stressor (short) baseline model (i.e., 22.63% - 20.54% adj).

Table 3.2.2.7
Backward Regression: Model of Best Fit (Short Form Scales) - Composite Strain on Significant OSI Stressor (Short) Expectancy (Short) and Valence (Short) Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
OSI Stressor, Expectancy & Valence Scales	OSI Role-Boundary#			.3718	3.602	.0006
	Expectancy Role-Ambiguity	24.25%	22.21%	-.2578	-2.497	.0147
Mult R=.4925; SE 13.5077; F(2,74) 11.8473, p. 0000						

Note: #Transformed Scale

Hierarchical modelling (See Table 3.2.2.8) was used to further explore the importance of role-ambiguity expectancies when placed in the presence of significant role-boundary and role-overload common stressors. As the results show, the inclusion of the Expectancy Role-Ambiguity scale in the model explained an additional 4.34% (3.42% adj) of the variance in strain beyond that explained by the baseline OSI common stressor (short) model.

Table 3.2.2.8
Hierarchical Regression: Composite Strain on Significant OSI Stressor (Short) and Expectancy (Short) Scales

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
	Step 1								
OSI Stressor (Short)	R-Boundary#	22.63%	20.54%	20.54%	.0001	.3854	3.05 - 10.10	3.715	.0004
	R-Overload					.2213	.07 - 1.20	2.133	.0363
Mult R=.4757; SE 13.6520; F(2,74) 10.8201, p. 0001									
	Step 2								
Expectancy	Exp R-Ambig	26.96%	23.96%	4.34%	.0408	-.2183	-1.92 - -.04	-2.082	.0408
Mult R=.5193; SE 13.3543; F(3,73) 8.9838, p. 0000									

#Transformed Variable

The significance of the Expectancy Role-Ambiguity scale in the model of best fit is further apparent from the magnitude of its unique contribution to the variance explained by the model of best fit. As the results in Table 3.2.2.9 show, when placed in the presence of the OSI Role-Boundary scale, the expectancy of role-ambiguity stressors accounts for an increased 6.38% (5.44% adj) of variance in strain beyond the 17.87% (16.77% adj) explained by the recognition of common role-boundary stressors. That is, in proportional terms, the expectancy scale accounts for 24.49% of the variance explained by the model.

In summary, the regression results indicate that the personal meaning assigned to the expected effects of common ambiguity stressors associated with study at university contributes unique and significant information to the explained variance in symptoms of strain.

Table 3.2.2.9
Hierarchical Regression: Model of Best Fit Scales - Composite Strain on OSI Stressor (Short) and Expectancy (Short) Scales

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
	Step 1								
OSI Stressor (Short)	R-Boundary#	17.87%	16.77%	17.87%	.0001	.4227	3.66 - 10.77	4.04	.0001
Mult R=.4227; SE 13.9713; F(1,75) 16.3188, p. 0001									
	Step 2								
Expectancy	Exp R-Ambig	24.25%	22.21%	6.38%	.0147	-.2578	-2.09 - -.235	-2.50	.0147
Mult R=..4925; SE 13.5077; F(2,74) 11.8473, p. 0000									

Transformed Variable

3.2.2.6 Personal Meaning Sample

3.2.2.6.1 Data Screening and Normality Assumptions

Following the initial screening of the raw data (n = 74) one case was removed from the data base due to a sequence of non-random missing values. Missing values were minimal throughout the raw data. A total of 36 missing values were evident throughout the data set and averaged 0.26 for the 140 variables in the data set. Where present they were replaced with the mean value for the variable. From further screening of the data, item four in the expectancy questionnaire "Having to take coursework home with me will cause me stress" was found to be missing from the Role-Overload scale due to a typographical error. Therefore, to maintain equivalence across the expectancy and valence scales, item four in the valence Role-Overload scale was removed from the scale. In addition, to improve the face validity of the Composite Strain scale, the items "irritability" "Tense/Anxious" Depression" and "Falling/Staying asleep" were dropped from the Physical Strain scale due to their semantic similarity with items in the Psychological Strain scale.

Univariate outliers and values noticeably distant from the general distribution of the data were recoded to values one unit higher than the next most deviant value in an attempt to improve the normality of the data distribution (Orr et al., 1991; Tabachnick & Fidell, 1989). Variables with extreme skewness were then transformed using either square root or logarithm techniques in a further attempt to bring the skewness within

normal limits (Brown & Di Milia, 1995; Dooley et al.,1987; Stone & Hollenbeck, 1989).[6] From regression analyses, one case was identified as a multivariate outlier. It was removed from the data set.

The remaining 72 cases in the data set, however, do not provide the desired power of 0.80 at alpha 0.05 (Two Tailed) by which to detect a medium ES of 0.15 (i.e., R^2 of 15%) in multiple regression analyses (Cohen, 1992). From the table for power provided by Cohen (see Table 2, p. 158), to detect a significant multiple correlation of medium ES from the effect of five IV's at a desired power of 0.80 and alpha 0.05 (Two-Tailed), a minimum of 91 cases is required in the data set. However, as previously discussed (see section 3.2.2.5.1), the results from previous research suggest that an ES of approximately 0.30 may be expected from the effect of the IV's used in the regression model. This value is more closely aligned with a large ES of 0.35 and the requirement for a minimum of 42 cases to provide a power of 0.80 at alpha .05 (Two Tailed). Consequently, for an expected ES of 0.30 and a desired power of 0.80 at alpha 0.05 (Two Tailed), a sample size n = 72 provides an 80.0% probability that the sample will reject the null hypothesis. Furthermore, the case to IV ratio of 14.4:1 satisfies the minimum requirement for multiple regression analyses (Tabachnick & Fidell, 1989).

3.2.2.6.2 Descriptive Statistics

Descriptive statistics (n = 72) for the scale means, standard deviations (SD's), scale response range, skewness and internal consistency (i.e., Cronbach alpha coefficients) are shown in Appendix B.3.1; a summary of the variability data for (a) the 10 item expectancy and valence scales, (b) the 10 item OSI stressor scales used by the descriptive

[6] The standard error of skew provides the basis to calculate a Z score which can then be used to reject the null hypothesis for skewness. This study used an alpha level of 0.023 (i.e., Z = 2.0) to determine the maximum skew coefficient for a normal distribution. That is, skew values approaching or greater than two SE's (i.e., 0.566) were considered to reject the null hypothesis for skewness.

sample, and (c) comparative mean variability statistics from the descriptive sample and study one are presented in Appendix B.3.2; and a graphical summary of the distribution of the raw data cumulative frequencies for the parallel expectancy and valence scales prior to the removal of outliers from the data set and transformations of the raw data (i.e., n = 73 cases) in Appendix B.3.3.

3.2.2.6.3 Scale Correlations

Pearson zero-order correlations (n = 72) for the expectancy, valence and composite scales with dimensions of strain are shown in Table 3.2.2.10; and comparison correlations for the expectancy and valence original and transformed scales with dimensions of strain in Table 3.2.2.11. The correlations reflect two-tailed tests for significance at $\alpha \leq$ 0.05* or 0.01** as indicated.

Correlations With Strain

Correlations between the expectancy scales and dimensions of strain (see Table 3.2.2.10) are generally low or not significant. As evident from the table, the expectancy scale Role-Boundary correlates a low 0.34** with the Composite Strain scale; the Role-Insufficiency scale 0.33** with the Psychological Strain scale; and the Composite Expectancy scale 0.34** with the Composite Strain scale. By contrast, correlations between the valence scales are all not significant. For instance, of the valence scales, the Role-Ambiguity scale on average correlates a low and non significant -0.21 with strain. Further, contrary to the "non-stressful" emphasis of the items in the valence scales and the recoding of scores (i.e., the reversal of 3 = 0 and 0 = 3) to reflect a stressful orientation, the correlations for the ambiguity and insufficiency valence scales with strain are generally negative. For instance, the ambiguity item "Having lecturers or tutors provide me with useful feedback about my coursework is" depicts the nature of items that were

recoded to reflect a stressful response. Thus, participants were required to recognise the changing emphasis of the items and give their response to the stressful or non-stressful emphasis of the items. The negative correlations, however, imply that participants (a) may have found the items confusing and (b) opted to interpret all the items in the stressful direction and responded accordingly. Therefore, it would seem subsequent recoding has returned the emphasis of the scale items to the non-stressful direction.

However, as previously discussed (see 3.2.2.5.3), due to low power, the significance of the correlations with strain may in effect reflect the presence of Type 2 errors. As indicated in the table for power provided by Cohen (1992), to achieve a desired power of 0.80 to detect a medium ES of 0.30 at α 0.05 (Two Tailed) requires a sample size n = 85. For this sample, the available power from sample size n = 72 and a medium ES of 0.30 is a slightly lower 0.73 (see Cohen & Cohen,1983, Table F.2, p. 529). In other words, with a sample size n = 72 the probability of making a Type 2 error (i.e., accepting the null hypothesis when it is actually false) is increased to 27% and the probability of detecting a significant medium ES of 0.30 from the sample is reduced to 73%.

Interscale Correlations

Correlations between the expectancy scales indicate some low to moderate overlap or confounding among the scales. For instance the Role-Boundary, Role-Insufficiency and Role-Overload scales correlate 0.56**, 0.45** and 0.36** respectively with the Role-Responsibility scale. Therefore, the expectancy scales may be seen as essentially independent in nature. Further, the correlations between the expectancy scales and the Composite Expectancy scale are generally moderate and suggests that each expectancy scale contributes useful information to the composite scale.

Table 3.2.2.10
Correlations: Personal Meaning Sample - Expectancy, Valence and Strain Scales

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Expectancy																
1. Role-Ambiguity	----															
2. Role-Boundary	.44**	----														
3. Role-Insufficiency	.21	.41**	----													
4. Role-Overload	.07	.18	.24*	----												
5. Role Responsibility	.23	.56**	.45**	.36**	----											
6. Physical Environment	-.10	.30**	.22	.41**	.37**	----										
7. Composite#	.58**	.80**	.64**	.49**	.83**	.35**	----									
Valence																
8. Role-Ambiguity	.46**	.22	.05	-.08	.01	-.12	.20	----								
9. Role-Boundary	-.00	.12	.16	.00	.08	.19	.10	.23*	----							
10. Role-Insufficiency	.34**	.21	.04	-.08	.12	-.05	.20	.49**	.29*	----						
11. Role-Overload	-.08	-.15	.06	.33**	-.02	.02	.01	-.25*	.15	-.25	----					
12. Role Responsibility	.08	-.02	.23	.18	.20	.18	.18	.15	.19	.11	.33**	----				
13. Physical Environment	-.03	.01	-.09	.25*	.19	.45**	.10	.14	.10	.17	.01	.17	----			
14. Composite#	.30*	.14	.19	.11	.13	.11	.24*	.64**	.64**	.54**	.32**	.65**	.22	----		
Strain																
15. Physical	-.05	.30*	.20	.29*	.23	.19	.28*	-.20	-.08	-.17	.14	.07	-.08	-.10	----	
16. Psychological	.01	.27*	.33**	.23*	.25*	.21	.31**	-.23	-.10	-.14	-.03	-.09	-.07	-.22	.71**	----
17. Composite Strain#	-.00	.34**	.28*	.29*	.28*	.22	.34**	-.20	-.08	-.15	.06	.02	-.06	-.14	.96**	.87**

Note: n = 72; *p ≤ 0.05, **p ≤ 0.01 (two-tail); #Comp: Composite scale from sum of sub-scales

Correlations between the valence scales are generally not significant. However, as evident from the data, the Valence Role-Ambiguity scale correlates a moderate 0.49** with the Role-Insufficiency scale and the Role-Overload scale, a low 0.33** with the Role-Responsibility scale. The valence scales, therefore, may be seen as essentially independent in nature. By contrast, with the exception of the Physical Environment scale, the correlations between the valence scales and the Composite Valence scale are generally moderate and significant. Thus, with one exception, each valence scale contributes useful information to the composite scale.

Correlations between the expectancy and valence scales and likewise those between the parallel expectancy and valence scales are by and large not significant. Specifically, of the scales in the matrix, the Expectancy Role-Ambiguity scale correlates a moderate 0.46** with the parallel Valence Role-Ambiguity scale and a low 0.34** with the Valence Role-Insufficiency scale. Similarly, the parallel expectancy and valence Role-Overload scales correlate a low 0.33** with each other. Furthermore, although low, the Composite Valence scale correlates a significant 0.24* with the Composite Expectancy scale. Therefore, on the basis of these correlations, it is feasible to conclude that the dimensions of expectancy and valence are relatively independent dimensions of personal meaning. Further, with two exceptions, there is little supportive evidence to indicate that a high level of fusion exists between parallel expectancy and valence appraisal processes.

The correlations between the strain scales indicate the existence of both multicollinearity and singularity among the dimensions of strain. As the table indicates, the Physical Strain scale correlates 0.71** with the Psychological Strain scale and a much higher 0.96** with the Composite Strain scale; and the Psychological Strain scale, a slightly lower 0.87** with the Composite Strain scale. Therefore, the Physical and Psychologi-

cal Strain scales may be seen as reasonably independent in nature; conversely, the relationship between the Physical and Psychological Strain scales with the Composite Strain scale as essentially singular in nature. The high correlations between the strain scales indicate that either the Physical and Psychological Strain scales or alternatively, the Composite Strain scale should be removed from the measurement model. However, for comparative purposes, it is necessary to retain these dimensions of strain in the measurement model.

3.2.2.6.3.1 Comparison of Original and Transformed Scales

A comparison of the correlations with dimensions of strain obtained from the transformation of stressor scales with skewed distributions is shown in Table 3.2.2.11. As evident from the table, the transformation of skewed variables does not necessarily improve the correlation with a dependent variable.

Table 3.2.2.11
Correlations Personal Meaning Sample: Comparison of Original and Transformed Expectancy and Valence Scales with Dimensions of Strain

Transformed Stressor Scales	Strain Scales: Physical Orig#	Physical Trans#	Psychological Orig#	Psychological Trans	Composite Orig#	Composite Trans
Expectancy						
1. Role-Ambiguity	-.05	.03	.01	-.03	-.00	-.01
2. Role-Overload	.29*	-.32**	.23*	-.24*	.29*	-.31**
Valence						
3. Role-Ambiguity	-.20	.17	-.23	.21	-.20	.18
4. Role-Insufficiency	-.17	.14	-.14	.13	-.15	.13

Note: n = 72; *p ≤ .05, **p ≤ .01 (two-tail); Orig# Correlation With Original Stressor Scale; Trans# Correlation With Transformed Stressor Scale

For instance, the transformation of the expectancy Role-Overload scale increased the correlation with the Physical Strain scale from 0.29* to -0.32**; those with the Psychological Strain scale from 0.23* to -0.24*; and those for the Composite Strain Scale,

from 0.29* to -0.31**. Conversely, the correlations for the Valence Role-Ambiguity scale with dimensions of strain, on average decrease from -0.21 (ns) to 0.19 (ns). Furthermore, when applicable, the transformed scale replaced the original scale in regression models that sought to explore the relative effect of stressor expectancy and stressor valence on symptoms of strain.

4.2.2.6.4 Regression Analyses

The results from a series of backward regression analyses which explore the relative effects of the original and transformed expectancy and valence stressor scales on the Composite Strain scale are shown in Table 3.2.2.12. For each model, an alpha pout of ≥ 0.051 (two Tailed) was used to effect the removal of an IV from the regression model.

As evident from the table, the effect of stressor expectancies were the only significant predictors of strain for this sample. Specifically, from the original expectancy scales, the relative effect of expectancies assigned to role-boundary and role-overload stressors explained 14.20% (adj) of the variance in strain. While, for the model using transformed expectancy scales, the relative effect of expectancies for role-boundary and role-overload (transformed) stressors explained a slightly increased 14.82% (adj) of the variance in symptoms of strain.

For the valence scale models, however, none of the stressor valence scales were significant at the 0.05 (two tailed) level of significance. As the final equations for the valence models show, the Role-Ambiguity scale in the original scales model was the only variable that approached the required level of significance to remain in the model. This variable although significant at the ≤ 0.10 (i.e., SPSS default pout) level of probability (i.e., t = -1.746, signif t = 0.0852) was above the required pout 0.051 probability to

remain in the model. Similarly, for the transformed scales model, the Valence Role-Ambiguity scale (i.e., t = 1.488. signif t = 0.1412) was the most significant predictor of strain in the final equation for the model.

Table 3.2.2.12
Backward Regression: Baseline Models - Composite Strain on Expectancy and Valence Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Expectancy (Orig Scales)	Role-Boundary	16.61%	14.20%	.2964	2.651	.0099
	Role-Overload			.2311	2.068	.0424
Mult R=.4076; SE 13.1785; F(2,69) 6.8735, p .0019						
Expectancy (Transformed Scales)	Role-Boundary	17.22%	14.82%	.2819	2.506	.0146
	Role-Overload#			-.2468	-2.194	.0316
Mult R=.4150; SE 13.1303; F(2,69) 7.1776, p .0015						
Valence (Orig Scales)	Role-Ambiguity	00.00%	00.00%	-.2043	-1.746	.0852**
	Role-Insufficiency			-.1506	-1.275	.2066
	Role-Boundary			-.0841	-0.706	.4823
	Role-Overload			-.0617	-0.517	.6066
	Role-Responsibility			.0145	-0.121	.9041
Mult R=.0000; SE 14.2270; F(0,71) Undefined						
Valence (Transformed Scales)	Role-Ambiguity#	00.00%	00.00%	.1751	1.488	.1412
	Role-Insufficiency#			.1247	1.051	.2968
	Role-Boundary			-.0841	-0.706	.4823
	Role-Overload			.0617	0.706	.6066
	Role-Responsibility			.0145	0.121	.9041
Mult R=.0000; SE 14.2270; F(0,71) Undefined						

Note: pout ≤ 0.05 (two-tail); #Transformed Variable; ** Significant at pout ≤ 0.10 Two-Tail, (SPSS Default)

Therefore, given these results from the expectancy and valence regression analyses, there is in effect only partial support for the hypothesis (H1) that the valence and expectancy of common study stressors would each explain a significant percentage of the

variance in symptoms of strain. That is, there is support for the importance of expectancy appraisals in the transactional relationship with symptoms of strain; conversely, the results indicate that that valence dimensions of appraisal have no significant effect in the stressor to strain process Furthermore, due to the non-significant effect of the stressor valence on strain, there is no support for the hypothesis (H2) that the relative effects of expectancy and valence study demands would each contribute significant information to the explained variance in strain.

3.2.2.7 Comparison of the Results

3.2.2.7.1 Introduction

Table 3.2.2.13 shows a summary of the variance explained by commensurate OSI stressor, expectancy and valence regression models from the use of either original or transformed scales in the respective models. One statistical method which may be used to verify the significance of the difference between independent Multiple R coefficients (i.e., R^2), is to test the difference in R^2 against Z at α 0.05 (two Tailed) using Fisher's transformation of r to r` as the basis for the Z test (Cohen & Cohen, 1983). However, as previously discussed (see 3.2.2.6.1), a sample size n = 72 does not provide the desired power of 0.80 at α 0.05 (Two Tailed) to test a medium ES difference in R^2. As Cohen (1992) notes, to detect a medium ES at power 0.80 and α 0.05 (Two Tailed) requires a sample size of n = 177 (Table 2, p. 158). Therefore, given the inability of the sample to detect a medium ES at a desired probability of 0.80, the use of Z tests based on Fisher's transformation of r to r` is an invalid method by which to verify the significance of differences in R^2. As a result, the data in the table should be treated with caution. It indicates only possible trends in the relative ability of common stressor and personal meaning sources of stress to explain the variance in symptoms of strain.

3.2.2.7.2 Comparison of the Descriptive, Expectancy and Valence Models

As evident from Table 3.2.2.13, there are seemingly significant differences in the ability of commensurate descriptive, expectancy and valence stressors to explain the transactional process underlying the translation of stress to symptoms of strain. Given the face value of the data, the cumulative effect of the OSI stressor scales across the dimensions of strain is, it would seem, clearly superior to the effect of either the expectancy or valence of common stressors on dimensions of strain. The OSI stressor model using transformed scales explains on average 27.88% (adj) of the variance in strain and the expectancy model using transformed scales, on average a much lower 12.44% (adj) of the variance in strain. By contrast, and consistent with the results from study one, the valence models do not explain any of the variance in strain.

When variance explained by the models is compared in differential terms, there is an average differential of 15.44% (adj) in the variance explained by the commensurate descriptive and expectancy models and a lower differential of 12.44% (adj) between the commensurate expectancy and valence models. In other words, from the results for the independent samples, the recognition of common study stressors explains on average 124.1% more variance than the nature of the personal meaning assigned to stressors.

However, due to the low power of the samples, the differential results are in effect inconclusive. To conclude that the recognition (i.e., description) of common stressors is the dominant cognitive process underlying the transactional process of stress is substantiated on the basis of the results from the independent samples is invalid (i.e., Type 1 error). There is, in effect, no valid evidence to support the hypothesis (H3) that common study stressors would explain significantly more of the variance in strain than the valence or expectancy of common study stressors.

Table 3.2.2.13
Summary of Commensurate Regression Models: Comparison of Descriptive, Expectancy and Valence Baseline Models on Dimensions of Strain

Regression Model	Strain Scale							
	Physical		Psychological		Sqrt Psychological		Strain Composite	
	Final Model+	Rsqr (Adj)	Final Model+	Rsqr (Adj)	Final Model+	Rsqr (Adj)	Final Model+	Rsqr (Adj)
OSI Stressor (Raw Scales)	R-Ambig R-Respons R-Overload	30.89%	R-Overload R-Ambig R-Respons	25.34%	R-Overload R-Ambig R-Respons	25.55%	R-Ambig Role-Resp R-Overload	32.28%
OSI Stressor (Transformed Scales)	R-Ambig# R-Respons# R-Overload	30.01%	R-Overload R-Ambig# R-Respons#	24.71%	R-Overload R-Ambig# R-Respons#	25.46%	R-Respon# R-ambig# R-Overload	31.34%
Expectancy (Raw Scales)	R-Boundary R-Overload	11.91%	R-Insuffic	9.53%	Not Used	----	R-Boundary R-Overload	14.20%
Expectancy (Transformed Scales)	R-Overload# R-Boundary	12.98%	R-Insuffic	9.53%	Not Used	----	R-Boundary R-Overload#	14.82%
Valence (Raw Scales)	Nil Significant	----	Nil Significant	----	Not Used	----	Nil Significant	----
Valence (Transformed Scales)	Nil Significant	----	Nil Significant		Not Used	----	Nil Significant	----

Note: 1) +Variables in Final Equation: (a) Pout ≥ .051; (b) Shown in Order of Significance; 2) #Transformed Scale Models: Original Scales Replaced With Transformed Scales.

3.2.2.9 Discussion

Using a commensurate approach to measurement and two essentially independent samples, the results of the study fail to support the hypothesis (H3) that the effect of common study stressors would account for significantly more of the variance in symptoms of strain than the effect of expectancy and valence demands associated with study at university. As shown by the comparative statistics (see Table 3.2.2.13), the recognition of common study stressors explained a moderate 31.34% (adj) of the variance, stressor

expectancy a substantially reduced 14.82% (adj) of the variance in strain and the effect of the valence assigned to stressors, no useful information to the variance in symptoms of strain. Therefore, based on these results, the presence of common role-responsibility, role-ambiguity and role-overload stressors associated with study (see Table 3.2.2.4) and the expected effects of role-boundary and role-overload stressors (see Table 3.2.2.12) are the significant sources of stress related to study at university for this sample.

When taken at face value, the differential data suggests that the effect of common study related stressors (i.e., recognition of stressors) is significantly superior to the effect of expectancy demands (i.e., R^2 differential 15.44%) and the valence (i.e., R^2 differential 27.88%) attributed to the attributes of common study stressors on symptoms of strain. Similarly, the differential between the variance explained by expectancy and valence demands (i.e., R^2 12.44%) suggests that the effect of stressor expectancy is significantly greater than the effect of stressor valence on symptoms of strain In other words, the results indicate that the description (i.e., recognition) of stressors is perhaps the more dominant cognitive processes in the stress to strain relationship. In contrast, the appraisal of stressors in terms of expectancy (i.e., expected effects of common stressors) would seem to play a complementary or moderating role in the stressor to strain process. The appraisal of stressors in terms of valence (i.e., attractiveness of common stressors), however, appears to have no significant involvement in the stress to strain relationship. However, this is not to say that stressor valence is not important, but rather that it plays a different role in the stress to strain process (see later discussion). Furthermore, the differential effect of recognition and personal meaning stressors is further evident from the findings provided by the descriptive sample using short form recognition, expectancy and valence scales. As evident from the data (see Table

3.2.2.5), the short form recognition scales (i.e., measures of common study stressors) explained 20.54% (adj) of the variance, short form expectancy scales, a reduced 9.79% (adj) of the variance; and short form valence scales, a very low 4.14% (adj) of the variance in strain. On average, therefore, the data from both samples indicate that the recognition of common stressors accounts for more than twice the variance explained by stressor expectancy; and the expectancy of common stressors more than twice the variance explained by the valence of common stressors.

The differentials in R^2 explained by the detection and personal meaning of common stressors are, however, inconclusive. To conclude from the face value of the data, that (a) significant differentials underpin the role of recognition and expectancy cognitive processes in the transactional process of adjustment to stress or (b) dismiss the role of valence appraisals as insignificant in the transactional process is in effect invalid. As dis-cussed in the results, the sample size does not provide the desired power 0.80 at α 0.05 (Two Tailed) with which to test the significance of a medium ES against Z using Fisher's transformation of r to r` as the basis for the Z test. Therefore, on this basis, it is reasonable to conclude that, for this sample, there is in effect no significant difference between the effect of recognition and personal meaning cognitive processes on the translation of stress to symptoms of strain.

With respect to the first hypothesis, there is no support for the hypothesis (H1) that commensurate expectancy and valence scales would each contribute useful information to the explained variance in symptoms of strain. As shown by the results from the personal meaning sample, only the expectancy of role-boundary and role-overload stressors contribute useful information (i.e., 14.82% adj) to the explained variance. Likewise, the findings from the descriptive sample show that the expectancy of Role-Ambiguity stres-

sors explains a low 9,79% (adj) of the variance and the valence of Role-Ambiguity stressors, a very low 4.14% (adj) of the variance in symptoms of strain. Thus, taken collectively, based on the results obtained from two essentially independent samples and a commensurate approach to measurement, there is little evidence to substantiate the hypothesis that expectancy and valence stressors both contribute useful information to the explanation of strain. Furthermore, there is no support for the hypothesis (H2) that the relative effect of expectancy and valence stressors would each contribute useful information to the explained variance when in the presence of each other. As evident from the baseline expectancy and valence models for the personal meaning sample (see Table 3.2.2.12), stressors valencies were not significant predictors of strain and therefore unlikely to contribute useful information to the explained variance when in the presence of stressor expectancies.

The results obtained from the descriptive sample using short form descriptive, expectancy and valence scales provide a more instructive insight to the role and functional integration of the cognitive processes underlying the transactional process of adjustment to stress (and moreover, they tend to replicate those found in study one). However, due to the homogeneous nature of the items used in the short form scales and the reduced sampling capability of five item scales, the variables in the final equations for the regression analyses are often somewhat different to those achieved by the parent 52 item scales.

As previously discussed, the data obtained from the 52 item scales indicates that the recognition of stressors is perhaps the more dominant cognitive process involved in the translation of stress to strain. Similarly, from the use of short form scales, the results from a series of regression analyses that explored the functional integration or relative effects of parallel recognition and personal meaning sources of demand tend to support

this conclusion. As Table 3.2.2.6 shows, with the exception of the role-ambiguity model, the recognition of common stressors was the dominant effect in the models. However, for the role-ambiguity model, the appraisal of role-ambiguity stressors displaces the recognition of role-ambiguity stressors as the dominant effect in the model. Seemingly, the interplay of descriptive and appraisal processes is determined by the significance of (a) stressors specific to the person and (b) the expected effects of the stressor (Folkman & Lazarus, 1985; James & Jones, 1980). In this case, the uncertainty associated with study at university (e.g., the fear of poor grades for an assignment) is a logical source of stress and thereby likely to inflate the individual's awareness of role-ambiguity stressors. Consequently, there is some evidence to refute the findings from both samples that the cognitive meaning assigned to common stressors is essentially secondary to the recognition of common stressors or perhaps a supplemental cognitive process underlying the transactional process of appraisal and stress related outcomes.

Furthermore, the unique effect of expectancy appraisals is further evident from regression analyses that sought to identify the model of best fit or the model that provides the most parsimonious explanation of the variability in strain from the variables included in the measurement model. That is, the model sought to identify the relative effect of recognition and personal meaning sources of demand on symptoms of strain when in the presence of each other. As shown by the data (see Table 3.2.2.7), the unique effect of expectancies for the ambiguity of stressors added a low 1.67% (adj) to the variance explained by the descriptive baseline model (i.e., 20.54% adj). However, the result is in effect somewhat misleading as when the expectancy scale is placed in the presence of the variables in the descriptive baseline model (i.e., Role-Boundary and Role-Overload stressors), the incremental effect of the expectancy scale is more clear. It

explains an additional 4.34% (adj) of the variance beyond that explained by the recognition variables in the baseline model. Further, with respect to the model of best fit, when the expectancy scale is placed in the presence of the descriptive Role-Boundary scale, it adds an increased 6.38% to the 17.87% explained by the Role-Boundary scale. In other words, the actual effect of stressor expectancy in the transactional process is in effect more significant than the results for the baseline models and model of best fit indicate. Indeed, it explains 26.31% of the variance explained by the model (i.e., 24.25%).

Common to both samples, stressor valencies were by and large unable to contribute useful information to the explained variance in strain. The reason for this inability is seemingly a reflection of non-random "errors in measurement" or the effect of method variance contamination that acts to bias the response to items in the valence questionnaires. As evident from a review of the descriptive statistics and correlational data for the valence scales, the cumulative effect of often (a) narrow SD's, (b) constrictions in the range of responses, (c) high negative skew coefficients and (d) low Cronbach alpha coefficients for reliability subsequently reflect as non-significant correlations with the dimensions of strain (Spector & Brannick, 1995; Tabachnick & Fidell, 1989).

A further insight to the low correspondence between the valence and strain scales is evident from the cumulative frequency graphs for the descriptive and personal meaning samples. As the graphs for the descriptive and personal meaning samples show, with the exception of the responses to the Role-Responsibility scales, the distributions are all noticeably skewed in the negative direction. In other words, the skewed distributions for the valence scales suggest that a source of contamination common to the sample acts to bias the responses to the items in these valence scales (note, the mean scores for the valence scales are noticeably higher than the parallel expectancy scales).

One logical explanation for the negative skew of the valence scales is to conclude that the personal valence attributed to a stressor is in effect determined by the "social norm" as opposed to the "contextual norm" for the valence items (Ajzen & Fishbein, 1980, Williams & Clark, 1997). As Ajzen and Fishbein argue, a person's degree of compliance or conformity to the regulatory influence of social pressure is a direct reflection or function of their "normative beliefs" or, in more specific terms . . . "the person's beliefs that specific individual's or groups think (they) should or should not perform (a specific) behaviour" (p. 7). Therefore, it is logical to suggest that "collective norms" for the student group underlie the response to the valence items. However, the participants were first year students and this suggests they may not be fully socialised into accepting the beliefs and values that underpin the "contextual norms" for university students. Hence, the valence scales may in effect be tapping the "social norm" of the wider population on the attractiveness or valence of common study stressors.

The responses for both valence responsibility scales, however, are both normally distributed but distinctly bimodal in nature. Consequently, this may account for the resultant non-significant correlations with the Composite Strain scale for the descriptive and personal meaning samples (i.e., $r = 0.06$ & $r = 0.02$ respectively). Seemingly then, there are two essentially discrete groups of students with opposing views on the valence of responsibility. Those in the low response value groups indicating that the valence of responsibility is "mostly good"; and for those in the high response value groups, that the valence of responsibility is "mostly bad". Clearly, the broad range of responses to the responsibility items suggest that (a) the participants hold concrete views on the valence of responsibility and equally important, (b) that the response to the items is seemingly self-referrent in nature. That is, it would seem that the personal attractiveness of the valence items has effectively overruled the "social norm" for the valence items. Fur-

thermore, it is tempting to conclude that the skewed nature of the valence scales provide little information on the role of valence appraisals in the perception and appraisal of stressors or insight to the personal meaning of stressors. However, as indicated by the distributions of the responsibility data for both samples, the change in direction of the skewness from negative to positive suggests that the valence attributed to stressors is, to some extent, determined by the effect of individual differences on the relative attractiveness of stressors associated with study at university.

There is, however, an alternative explanation that essentially refutes the suggestion that "social norms" determine the response to the valence items. The expectancy and valence graphs for both samples suggest that the expectancy of stressors underpin the response to parallel valence stressors. That is, as evident from the graphs, the responses to the valence items tend to track the expectancy responses. Furthermore, there is also evidence to suggest that the effect of individual differences underpins the relationship between expectancy and valence in the tails of the distributions. As such, there is seemingly a functional linkage or fusion of the expectancy and valence dimensions of appraisal when used to assess the properties of a stimulus item (Ajzen & Fishbein, 1980; Vroom, 1964). For instance, the expectancy appraisal of a common stressor as "very likely to cause me stress" invariably corresponds to the valence appraisal "mostly bad". Moreover, as indicted by the graphs and often in the correlational data for both samples, the effect of expectancies tends to reflect both positive and inverse relationships with the intensity and frequency of the valence responses.

With respect to the descriptive sample (see Appendix B.1.3 & Figures B.1 - B.5), the graphs for role-ambiguity indicate that the effect of expectancy demands track the valence of ambiguity demands. Below the response value 8 increasing expectancy

demands (i.e., 2 - 8) reflect as a gradual increase in valence demands. However, beyond response value 8, the effect of high expectancy demands (i.e., will likely cause me stress) translates to a sharp increase in the number of participants who view the valence of ambiguity demands as essentially negative (i.e., mostly bad). Furthermore, the significant correlation (i.e., r = 0.45**) between the scales supports this reasoning.

For the role-boundary scales, the graphs indicate that the interaction between expectancy and valence reflect two discrete conditions. Below the response value 5, increases in the level of expectancy demands correspond to a gradual increase in the number of participants reporting an associated increase in valence demands. Beyond response value 5, however, there is a reversal in the relationship; a reduction in the number of participants reporting high role-boundary expectancy demands translates to a sharp increase in the number of participants reporting high valence demands. In other words, there is seemingly a cut-off point for the amount of interpersonal conflict people will or able to tolerate; beyond this point, the valence of boundary demands is seen as mostly bad by the majority of participants. The low but significant correlation between the scales (i.e., r = 0.36*) supports the trend depicted in the graphs. Similarly, for the role-insufficiency graphs, at high levels of expectancy demands (i.e., beyond response value 8) there is a sharp increase in the number of participants reporting the valence of insufficiency demands as mostly bad. The low but highly significant correspondence between the insufficiency scales (i.e., r = 0.39**) reflects this reasoning.

The graphs for the role-overload scales are basically identical up to response value 7 and suggests a high correspondence between the expectancy and valence of role-overload stressors. That is, increases in expectancy demands reflect as a corresponding increase in valence demands. However, beyond this value there is seemingly an inverse relationship between the expectancy and valence of stressors. That is, for high levels of

expectancy overload demands there is a noticeable decrease in the number of participants reporting that valence overload demands are mostly bad. Further, if the participants with expectancy response value greater than 7 are extracted from the sample (i.e., n = 51), the valence scores for this sub-group depict a correspondence with the trend of the graphs. Specifically, the mean value for the valence overload scores (i.e., 12.16) is noticeably less than the mean value for the expectancy overload scores (i.e., 14.18). Moreover, the expectancy scores range from 13 - 15 and the valence scores from 2 - 15. In other words, the data indicates the effect of individual differences on the response to valence stressors, that is, the degree of attraction of overload stressors (James & Jones, 1980).

Seemingly then, for this group of participants, the expectancy that common overload stressors will cause high levels of stress does not necessarily translate to the appraisal of role-overload stressors as mostly bad. The expectancy of high personal stress from common role-overload stressors would seem to increase the valence (i.e., attractiveness) of common overload stressors. As such, there is the inference that these participants appraise role-overload stressors as a source of challenge rather than a discrete source of stress. Personality dispositions for hardiness (i.e., cognitive styles for "control", "commitment" and "challenge") would seem to underpin the inverse relationship (i.e., transactional outcome) between overload expectancy and valence stressors for the high expectancy group (Kobasa, 1979, p. 3). Similarly, James and Jones (1980) in a discussion that considered the role of higher-order cognitive processes in job perceptions argue . . . "it is also important to note that individual differences in background and previous learning may lead to differences in how events are experienced and in what is judged to be (i.e., perceived as) challenging, autonomous, and important" (p. 99). While for those in the low expectancy group (i.e., response values at or below 5), there is the

inference that for lower levels of hardiness cognitive styles, there is a positive relationship between expectancy and valence stressors. The non-significant correlation between these scales (i.e., r = .21), however, does not support the above reasoning.

With regard the graphs for role-responsibility, if the distribution profiles are synchronised, they are by and large basically similar in distribution. As such, there is the inference that the expectancy of responsibility stressors underpins the valence of responsibility stressors. Furthermore, at response value 2, there is a clear reversal in the response to the expectancy and valence items. That is, at or below 2, there is an increase in the frequency of participants reporting reduced values for the expectancies of responsibility stressors and a reduction in the number of participants reporting the valence of responsibility as mostly bad (i.e. there is an increase in the attractiveness of the stressor). Specifically 13 or 16.5% of the sample report low values for the expected effects of role-responsibility stressors and 8 participants or 10.0% of the participants, low values for the valence of role-responsibility stressors (i.e., that the stressor is mostly good).

The inverse nature of the data suggests that individual differences underlie the appraisal of role-responsibility stressors. It suggests that individual differences (a) underpin the appraisal of expectancies for responsibility and (b) dictate the subsequent valence assigned to responsibility stressors. In this case, it would seem that low expectancies of stress from facets of responsibility translates to an increase in the attractiveness of responsibility for this group of participants. Put another way, if seen in terms of hardiness, the dispositional nature of this group is seemingly low in hardiness. A precondition for responsibility is, it would seem, low expectations of stress from responsibility demands.

Equally revealing, the responsibility graphs suggest the existence of two discrete groups of participants. One group confined by the response values 2 and 5, and the other between the vales 5 and 9. The responses in each group seeming to fall in reasonably normal distributions and the profiles suggesting a positive relationship between expectancy and valence. For example, at the extreme tails of each distribution, there is a decrease in the number of people reporting the maximum value for responsibility expectancies and a similar decrease in the number of participants reporting the maximum value for the valence of stressors (i.e., mostly bad). In other words, from the mode of the distributions, as the response values for expectancy and valence increase, there is a corresponding decrease in the number of people who report that (a) responsibility will most likely cause them stress and (b) the attractiveness of responsibility as mostly bad. Therefore, when considered in terms of hardiness, those at the lower end of the distribution would seem to possess a low disposition for hardiness and those at the high end, a high disposition for hardiness or resilience to the effect of expectancy and valence responsibility stressors. However, the non-significant correlation between the expectancy and valence scales (i.e., $r = 0.03$) does not support the suggested relationship between the responsibility scales.

The expectancy and valence graphs for the personal meaning sample (see Appendix B.3.3 & Figures B.6 - B.10) are reasonably similar to the response distributions for the descriptive sample. For instance, the ambiguity graphs for expectancy and valence are essentially similar, that is, they tend to track each other along the range of the scale. Moreover, similar to the descriptive sample, at the tail of the distribution there is a sharp increase in the number of participants reporting high valence values (i.e., mostly bad) in comparison to the number reporting high expectancy values (i.e., will very likely cause

me stress). Seemingly, high expectancies of stress from ambiguity demands (e.g., fear of poor grade for an assignment) corresponds to a sharp reduction in the attractiveness of their course of study. The moderate correlation between the scales (i.e, r = 0.46**) reflects the high correspondence or functional link between the scales.

Furthermore, similar to descriptive sample, the responses for the boundary scales suggest two relational conditions evolve from the interaction of expectancy and valence stressors. Below response value 8, increases in the response value reflect as an increase in the number of people reporting an increase in the expectancy of boundary demands and a gradual increase in the number of people reporting an increase in boundary valence demands. Beyond response value 8, however, there is once again a sharp reversal in the correspondence between expectancy and valence; increases in the value for expectancy translate to a sharp increase in the number of people reporting high boundary valence demands. Moreover, at response value 13, there is a reversal in the relationship between the expectancy and valence of role-boundary stressors. At high levels of expectancy demands (i.e., n = 20), there is sharp reduction in the number of people reporting boundary valence demands (i.e., n = 9). In other words, the graphs suggest that some of the participants actually prefer situations with high levels of conflict (i.e., the valence of the boundary stressor is mostly good). However, the non-significant correlation between the scales (i.e. r = 0.12) does not support this reasoning.

The distributions for the role-insufficiency items are basically similar to those obtained from the descriptive sample. As evident from the graphs, up to response value 12 there is a low but positive correspondence between the expectancy and valence of stressors; a sharp increase in the number of people reporting an increase in expectan-

cies for insufficiency corresponds to a very gradual increase in the number of participants reporting an increase in valencies for insufficiency demands. That is, for this group of participants, increasing expectations of stress from insufficiency stressors does not necessarily translate to an increase in the negative valence attributed to an insufficiency stressor (i.e. appraise insufficiency stressors as mostly bad). Conversely, beyond response value 12, there is a sharp reversal in the correspondence between the expectancy and valence of stressors. A reduction in the number of participants who anticipate high levels of stress from insufficiency stressors (i.e., n = 22) corresponds to sharp increase in the number of participants (i.e., n = 58) reporting high valence demands from insufficiency stressors. That is, high expectations of stress from insufficiency stressors seemingly corresponds to a sharp decrease in the attractiveness of insufficiency stressors associated with study at university (e.g., feeling that the course will provide a good future). The correlation between the scales is not significant (i.e., r = 0.04) and therefore does not provide any support for the above reasoning.

The role-overload expectancy and valence distributions are similar to those for the descriptive sample. As the graphs indicate, up to the response value 13, an increase in the number of people reporting an increase in the anticipated effect of role-overload stressors relates to a linear increase in the number of people reporting an increase in the negative valence of role-overload stressors. However, beyond response value 13, there is an inverse relationship between the expectancy and valence of stressors. An increase in the number of participants who expect high levels of stress from the effects of overload stressors reflects as a sharp decrease in the number of people who appraise the valence of overload stressors as highly negative (i.e., mostly bad).

Further, if the participants with an expectancy response greater than 13 are selected from the sample (i.e., n = 25), the valence scores seem to reflect a correspondence with the trend of the graphs. Specifically, the mean score for the valence scores (i.e., 15.32) is substantially less the mean score for the expectancy scores (i.e., 24.16); and the range of the valence scores varies between 9 and 20. Therefore, similar to the descriptive sample, the data suggests that individual differences underpin or dictate the response to the valence of stressors at high levels of anticipated stress from the effect of role-overload stressors. Moreover, in accord with the descriptive sample, the data would seem to indicate that the expectation of high levels of stress actually increases the personal valence of common overload stressors. Presumably, for this sub-group, the stressor is seen as a source of challenge rather than a source of stress. As such, the personality disposition of hardiness may be seen as a viable basis by which to explain the effect of individual differences on the appraisal of expectancy and valence stressors and the translation of stress to strain. The low but highly significant correlation (i.e., r = 0.33**) between the scales reflects the above reasoning. That is, there is support for the presumption that a fusion or functional linkage of the expectancy and valence appraisals underlies the recognition and appraisal of overload stressors.

Similar to the descriptive sample, the distribution of the valence role-responsibility scores tend to imitate or follow the profile of the expectancy distribution. Furthermore, there is a reversal in the distribution at the tails and the suggestion that two groups underlie the expectancy and valence responses. The lower group falling within the response values 2 and 9 and the other, within the values 9 and 15. At the lower tail, an increase in the value of the expectancy response corresponds to a lower number of participants reporting an increase in the value for the valence of responsibility stressors. That is, at low levels of expected stress from the effect of responsi-

bility stressors there is seemingly an increase in the valence or attraction of responsibility stressors. Conversely, at the opposite tail, an increase in the number of people reporting high expectancy demands reflects as a sharp decrease in the number of participants reporting high levels of valence demands from the effect of responsibility stressors. Seemingly, for this group of participants, a high probability of stress corresponds to an increase in the attraction of role-responsibility stressors in study at university.

Between the response values 6 and 12, however, there is evidence of a positive or linear correspondence between the expectancy and valence of stressors. As shown by the graphs, for increasing response values, increases or decreases in the number of people appraising the expectancy of a responsibility stressor, there is a corresponding increase or decrease in the number of people appraising the valence of the responsibility stressor.

In addition, the data suggests that the effect of individual differences in the disposition for hardiness underlies the interaction of expectancy and response. For those in the lower tail of the lower group, there is the inference that the correspondence of low expectancies and the attraction of responsibility reflects the responses of individual's with low dispositions for hardiness. For those in the centre, the inference of a linear increase in the level of hardiness across the response values; that is, increases in the correspondence of expectancy and valence require an increase in the level of hardiness to counteract the increase in the effect of expectancy and valence stressors. While for those in the upper tail of the second group, there is the presumption that the correspondence of high expectancies for stress and an increase in the attraction of

responsibility stressors requires individual's with high levels of dispositional hardiness. However, the non significant correlation (i.e., r = 0.20) between the expectancy and valence stressors does not support this reasoning.

The strain scale evaluations (see Appendix B.2, Table B.3 & Appendix B.4, Table B.6) identify subtle but important distinctions between the ability of physical, psychological and composite measures of strain to account for the translation of stress to strain from the effect of descriptive (i.e., common) and personal meaning stressors. As evident from the table, there are distinctions in the correspondence between sources of stress and the nature of strain related symptoms. For instance, when related to the recognition of common study related stressors, role-ambiguity was the most significant predictor of physical strain; role-overload the principal predictor of psychological strain; and role-responsibility, the principal predictor of composite symptoms of strain. Similarly, for the expectancy stressors, the expectancy of role-overload stressors was the principal predictor of physical symptoms of strain; role-insufficiency expectations the only predictor of psychological strain; and role-boundary expectations, the most significant predictor of composite strain. Hence, the question becomes in essence those of validity and efficiency: which measure of strain provides (a) the more valid and useful insight to the role of recognition and personal meaning sources of demand in the transactional process; and (b) best accounts for the translation of stress to symptoms of strain. As evident from the Cox (1978) transactional model of stress, the stress response may reflect as either discrete or combinations of psychological, physiological or behavioural outcomes (Feuerstein, Labbe', & Kuczmierczyk, 1986).

Therefore, based on the results, it would be tempting to accept the multidimensional 20 item Physical Strain scale as perhaps the more valid and efficient measure of strain. However, as evident from the data, the Psychological Strain scale is in effect the more efficient and more specific measure of strain (see also Osipow & Spokane, 1984). Further, if seen in relative terms, the Psychological Strain scale accounts for 82.0% of the variance explained by the Physical strain scale; and 79.0% of the variance explained by the Strain Composite scale. That is, the data indicates that physical symptoms of strain seemingly only account for around 6.0% of the variance in symptoms of strain. Therefore, on the basis of these results, the Physical Strain scale is not the more valid or efficient measure of strain. The composite approach to the measurement of strain is in effect the more valid, effective and versatile method by which to tap the diversity in symptoms of strain (Osipow & Spokane, 1884). As illustrated by the results, the composite scale accounts for an additional 1.33% (adj) in the explained variance when used with measures of common study related stressors and an extra 1.84% (adj) of the variance when used with measures of stressor expectancy. Further, with respect to versatility, it is possible to explore the effect of common and personal meaning sources of stress on symptoms of strain by extracting discrete measures of psychological and physical strain from items in the composite scale.

In summary, based on results from a commensurate approach to measurement, there was no support for the hypotheses (H1 & H2) tested by the data from two independent samples. As the results show, the recognition of common stressors explained the greater percentage of the variance (i.e., 31.34% adj); the expectancy of stress from effects of common stressors, a substantially reduced 14.82% (adj) of the explained variance; and the personal valence of common stressors associated with study at university, no useful information to the explained variance in strain. There-

fore, based on these results, there was no support for the hypotheses that (a) the expectancy and valence stressors would each explain a significant percentage of the variance in symptoms of strain; and (b) personal meaning stressors would each contribute useful information to the explained variance when in the presence of each other.

Moreover, due to low statistical power, it was invalid to test the hypothesis (H3) that the recognition of stressors is the primary or predominant cognitive process underlying the transactional evaluation of stressors (i.e., the imbalance between actual and ideal demands). That is, it proposed that common stressors would explain more of the variance in strain than the effect of the expectancy and valence assigned to stressors in the transactional process. Consequently, the issue of predominance in the cognitive processing of stressors remains unresolved. However, as evident from the commensurate scale analyses using short form scales (see Table 3.2.2.6), stressor expectancies were the dominant predictors of strain in the role-ambiguity model. This suggests that the functional linkage of recognition and appraisal cognitive processes is determined by the significance or expected effect of the stressor on the well-being of the individual. As Folkman and Lazarus (1985) argue, the appraisal of impending threat serves to initiate a process of adjustment to the impending or imposing source of threat.

The results from the descriptive sample using short form scales further illustrate the functional involvement of personal meaning, albeit only partial, in the recognition and appraisal of common stressors. As the results show, the expectancy of stressors contributes useful information to the explained variance; the personal valence of stressors, however, does not. That is, the results indicate that the prediction of strain within a descriptive nomothetic framework can be significantly improved by the in-

clusion of stressor expectancy in the measurement model. As evident from the data for the model of best fit, the expectancy of role-ambiguity stressors explained an additional 6.38% of the variance when placed in the presence of common role-boundary stressors.

On the whole, therefore, the results obtained from independent samples using both the long and short form recognition, expectancy and valence stressor scales tend to replicate those from study one. In addition, the significant contribution of stressor expectancy to the explained variance highlights the fact that measures of common stressors are unable to (a) fully capture the complex of cognitive processes underlying the perception and appraisal of stressors or (b) discriminate the role of personal meaning assigned to common stressors.

Furthermore, there is no substantive evidence to support the hypothesis that the valence of stressors contribute useful information to the explained variance in strain. This suggests that the valence assigned to stressors is not significantly involved in the transactional process underlying stress, that is, the individual's appraisal of an imbalance between actual and ideal stressors. Therefore, on the basis of these results, it is reasonable to conclude that the personal valence assigned to stressors plays no useful purpose in the measurement model and as a result, should be eliminated from the model.

However, as discussed, constrictions in the range of the valence responses, negative skewness and low Cronbach alpha coefficients for the valence scales are consistent irregularities in the distribution and reliability of the data. The resultant effect of these irregularities subsequently reflects as non-significant correlations with strain and the inability of the valence scales to predict strain. One logical explanation for the

skewed data is that either the social norm or the contextual norm for the valence items acts to overrule the contextual meaning attributed to the valence of the stressor. Perhaps this is so, but not necessarily the dominant factor underlying the bias of the valence responses.

The alternative explanation, however, has its basis in the correspondence of the graphical data and the significance of the correlations between parallel expectancy and valence scales. It was argued at length that the bias in the valence distributions is in effect a direct reflection of (a) the individual's self-referrent expectancies attributed to common stressors and (b) the effect of individual differences in the disposition for hardiness. The correspondence of the expectancy and valence graphs for both samples and the low but significant correlations between parallel stressors suggest some support for this reasoning. In short, although essentially implicit, there is evidence of a functional linkage or fusion of expectancy and valence appraisals when involved in the appraisal of common stressors. In effect, it is feasible to argue that the valence attributed to a common stressor is essentially descriptive in nature, in essence an indicator or cognitive expression of the individual's underlying expectancy of stress from the effect of a common stressor (James & Jones, 1980).

Future research, therefore, should take three directions. First, based on the findings from study one and the present study, there is need to further explore the relative effect of recognition (i.e., common) and expectancy stressors on symptoms of strain in an applied setting. Second, there is a need to broaden the locus of expectancy stressors. For instance, the expectancy of stress from demands associated with home/work, social support and self-related (i.e., personal resilience) stressors are possible sources of stress that may contribute useful information to the explained variance in strain. Third, the data indicates the need to adopt a more holistic and evaluative

approach to the measurement of expectancy and valence stressors. Hence, it is necessary to design a response scale that captures the fusion or functional linkage of expectancy and valence appraisal processes used to evaluate the probable effect and nature of common stressors.

As discussed in the rationale for this thesis, the appraisal of common stressors in terms of personal desirability is thought to reflect the cognitive amalgamation of expectancy and valence appraisal processes into a higher order appraisal process. The response anchors "Would Like More" "About Right For Me" and "Would Like Less" provide (a) the individual with a frame of reference by which to evaluate the personal desirability of common stressors and (b) the basis for an evaluative approach to the measurement of common stressors. Furthermore, the measurement of stressors in terms of personal desirability may reflect a moderate overlap or correspondence with the expectancy and valence of common stressors. Therefore, to confirm the relative independence of these appraisal processes it will be necessary to include measures of stressor valence and stressor expectancy in future research. Finally, concurrent to these three directions for research, there is also the need to (a) explore the effect of dispositions for hardiness on the explained variance and (b) further explore the ability of physical and psychological measures of strain to capture the translation of stress to symptoms of strain.

Study 3

Stress in Migrant Education Programmes: The Relative Effect of Common Work Stressors and Stressor Expectancy on the Variance in Strain

3.2.3.1 Introduction

A detailed description of this study and critical discussion of the findings from this study is presented in Appendix C.

Study 4

Stress in Youthworking: The Relative Effect of Common Work Stressors, Expectancies for Personal Strain, Beliefs Associated With Social Support Demands, Neuroticism and Coping on Symptoms of Strain[1]

3.2.4.1 Abstract

This study explored the relative effect on symptoms of strain of (a) the expectancy assigned to personal strain (b) beliefs concerning social support demands, (c) strategies for coping and (d) dispositions for neuroticism. The results from 135 Youthworkers employed at five Juvenile Justice Centres indicate that beliefs associated with the provision of social support, coping strategies and neuroticism cognitive styles contribute useful information to the explained variance beyond that explained by common work stressors.

The combined effect of common role-boundary stressors, expectancies related to personal strain and beliefs associated with social support demands explained 26.60% (adj) of the variance in strain; the addition of coping strategies to the model, an increased 52.10% (adj) of the variance in strain; and the model of best fit from the addition of neuroticism to the model, an increased 56.60% (adj) of the variance in strain.

Further, using hierarchical modelling, there was support for the hypothesis that appraisal of social support demands would add unique information to the explained variance when placed in the presence of significant dispositional, work role stressor and

[1] This study was conducted with the assistance of Geoff Troth, unit psychologist at a Juvenile Detention Centre run by the Department of Juvenile Justice of an Australian State Government.

coping variables. There was, however, no support for the hypothesis that expectancies assigned to personal strain would contribute unique information to the explanation of strain.

Furthermore, there was partial support for the hypothesis that individual differences would moderate relationships with symptoms of strain. The results from moderator analyses indicate that (a) rational/cognitive coping moderates the effect of role-overload work stressors and expectancies for personal strain; and (b) dispositions for neuroticism moderate the effect of beliefs concerning social support demands and rational/cognitive coping on symptoms of strain. In addition, it was concluded that a composite approach to the measurement of symptoms in strain provides the more effective and versatile method by which to capture or account for the nature of stressor to strain relationships. From these results, directions for future research are discussed.

3.2.4.2 Introduction

The results from studies one, two and three have shown that the expectancies attributed to common work stressors (i.e., beliefs concerning the probable effect of common work stressors) contribute useful information to the explained variance in symptoms of strain. However, when compared to the effect of common work stressors on strain related outcomes, the variance explained by expectancies is consistently rather small across the studies. Therefore, given these results, it suggests that the measurement and use of expectancies to tap the mental summation of the imbalance between actual (i.e., recognition of common stressors) and ideal (i.e., appraisal of common stressors) work demands has little practical utility in applied settings. Perhaps this is so, but it does, nonetheless, have both theoretical and heuristic value for the direction of stress research. As Cox and Ferguson (1991) note, research concerned with the spectrums of beliefs and attribution's is common in the stress literature and relates to the efforts of

stress researchers to both explore and derive an improved understanding of the mediating and moderating effects of individual differences in the stress process. As they further point out, although "psychologically different" these broad domains of cognition are in effect related cognitive processes:

> Beliefs are treated as antecedents of attributions and as more stable and trait like in nature. Attributions are viewed as state dependent and likely to fluctuate over time. (Furthermore, and relevant to the focus of the present study): Both belief states and attributions can produce future expectancy judgements with the difference that the latter tend to be situation specific and the former more general in nature (p. 15).

For instance, when considered in the transactional context, it may be the case that individual differences in the nature of personal expectancies assigned to symptoms of physical and psychological strain underpin the person's reaction to the nature of common work stressors (Antonovsky, 1991; Bandura, 1977, 1986; Cohen et al., 1995; Cox & Ferguson, 1991; Folkman, 1984; Kirk, Brown, & Smith, 1995; Kobasa, 1979, 1982). Therefore, it is feasible that the individual's appraisal of their current status of well-being may well reflect as an intrinsic source of stress and thereby act to either maintain or reinforce their prevailing symptoms of strain (Bowerman, 1988; Cox & Ferguson, 1991; Kahn & French, 1962; Kulik, Oldham, & Hackman, 1987, Lazarus et al., 1952; Pennebaker & Watson, 1988; Sutherland & Cooper, 1988).

The expectancies attributed to symptoms of physical and psychological strain, however, may reflect the individual's disposition for what is often termed resilience (Antonovsky, 1991; Cherry, 1978); self-efficacy (Bandura, 1977, 1986; Folkman, 1984) or in terms of hardiness, their optimism or disposition for "stress-resistance" (Kobasa, 1882, p. 9). That is, they may be regarded as reflecting the individual's self-evaluation or appraisal of their ability to function normally when confronted with varying levels of stimuli that may originate from either intrinsic and/or extrinsic environments. Beardslee (1989), for example, argues that "self-understanding" is the defining feature of re-

silience (p. 267); and that . . . "resilient individuals have a total organizing conceptualization of who they are and how they came to be" (p. 275). Thus, an individual's style of resilience may be seen as essentially holistic and transactional in nature. The evaluative role of appraisal may also be seen as a fundamental cognitive process which underpins the basis for self-understanding and the development of resilience Antonovsky, 1991). As Antonovsky notes:

> The three crucial dimensions which underlie self-understanding and resilience are: an adequate cognitive appraisal of stressors over time; a realistic appraisal of the capacity for and the consequences of action; and engagement in actions in the world (p. 93).

Antonovsky further argues that the three dimensions of self-understanding may be seen as essentially linked to the hardiness dimensions: control, commitment and challenge. Kobasa (1982) argues a similar case:

> Persons with (a sense of) control seek explanations for why something is happening not simply in terms of others' actions or fate, (there is) an emphasis on their own responsibility . . . They feel capable of acting effectively on their own. Commitment (reflects) the tendency to involve oneself fully in the many situations of life . . . (those which provide) an overall sense of purpose. Challenge . . . (the individual's) anticipation of opportunity and incentive for personal growth . . . (such persons) are characterised by an openness or cognitive flexibility and tolerance of ambiguity. (pp. 6-9).

The expansion of this line of argument to personal expectancies suggests the hypothesis that individual differences in hardiness underpin (a) the appraisal of work stressors, (b) the expectancy that particular work stressors will cause them stress and (c) the expectancies that individual's attribute to symptoms of strain.

Similarly, it is probable that individual's may at times appraise (a) their role in social relationships and (b) their provision of social support both at work and home (Cooper et al., 1988; Coyne & DeLongis, 1986; Osipow & Spokane, 1983, 1987) as perhaps sources of demand or negative facets of social interactions (Coyne & DeLongis, 1986; Hobfoll, 1988; Payne & Jones, 1987; Rhodes & Woods, 1995; Schabracq & Cooper,

1998). The findings of stress research consistently confirm the main or direct effect of social support on stress related outcomes, that is, social support is found to reduce symptoms of strain (Anshel et al., 1997; Beehr, King, & King, 1990; Boumans & Landeweerd, 1992; Fenlason & Beehr, 1994; Osipow & Davis, 1988). This is also shown in the results from study one (see Table 3.2.1.17). There is a significant main effect from the use of physical (i.e., self-care techniques such as regular exercise) and social support coping strategies by the participants to better cope with stress. However, although a logical extension of this position, there is no consistent evidence that social support exerts a moderating or buffering effect against stress (Beehr, et al., 1990; Coyne & DeLongis, 1986; Fenlason & Beehr, 1994; Ganster, Fusilier, & Mayes, 1986; Osipow & Davis, 1988). As Beehr et al. note, many authors report little or no evidence that social support buffers the stress-strain relationship; others buffering effects which decrease symptoms of strain; and yet others that buffering effects actually increase strain.

One explanation for this lack of consistency is that the form and/or source of social support either available to, or offered to the person, may in effect determine how, if at all, the nature of the social support acts as a buffer between stress and strain (Beehr et al., 1990). In other words, rather than a general effect of social support, it may be the case the individual's are, to some extent . . . "highly selective" in both their preference and general acceptance of social support (Beehr et al., 1990, p. 63).

Therefore, it is feasible to suggest that individual differences in (a) the preference for types of social support, (b) the desire to accept social support and/or (c) the willingness to provide social support may underlie the attraction or aversion to social support. Similarly, Cox and Ferguson (1991) in a discussion of the mediating role of individual

difference in the appraisal of stressors argue a similar case: "people may vary in their need for social support and the skills that they have for exploiting such support, and in their perceptions of support" (p. 12).

Variability in the response to both stressors and symptoms of strain implies that individual differences may indeed either mediate or moderate the stress process (Cox & Ferguson, 1991; Parkes, 1994; Payne, 1988a). For instance, the spectrum of appraisal processes used to attribute meaning to common work stressors are thought to function as essentially in-line mediators, intervening variables or cognitive filters of intrinsic and extrinsic environmental stimuli within the transactional model (Cox & Ferguson, 1991, Lazarus, 1993; Lazarus & Folkman, 1987; Peacock & Wong, 1990). This suggests that the recognition of stressors through their description is perhaps distorted or blurred to some extent by the spectrum of appraisal processes which interact with the cognitive processes of stress recognition (Caplan, 1983; Glowinkowski & Cooper, 1987; Kulik et al., 1987).

Moderating variables are, as Cox & Ferguson (1991) point out, deemed to . . . "alter the direction or strength of the relationship between two other variables" (p.12). A wide range of individual differences, including personal orientations for hardiness, locus of control, coping style, neuroticism and Type A behaviour, have been identified as moderators of the relationship between stressors and strain (Cox & Ferguson, 1991; Koeske, et al., 1993; Moyle, 1995; Osipow & Davis, 1988; Parkes, 1994; Payne, 1988a; Schaubroeck & Ganster, 1991; Spector & O'Connell, 1994). Neuroticism (i.e., negative affectivity or trait anxiety: Payne, 1988a), for example, has been widely used in both psychological research into stress (Moyes, 1995; Payne, 1988b; Walsh, Wilding, Eysenck, & Valentine, 1997) and general psychological research (Bartram; 1995; Gelman, et al., 1998). However, although the trait of neuroticism is often presumed to

function as a confounding or nuisance variable which acts to inflate the response to self-report measures of stressors and strain (Heinisch & Jex, 1997, 1998; Hurrell Jr. et al., 1998; Maddi, Bartone, & Puccetti, 1987; Moyle, 1995; Schaubroeck, Ganster, & Fox, 1992; Schroeder & Costa Jr, 1984; Smith & Reise, 1998), the validity of this dispositional variable is not without some support (Bartram, 1995; Heinisch & Jex, 1998; Jex & Spector, 1996; Maddi et al., 1987; Moyle, 1995). As Payne (1988a) concluded from a review of the role and effect of negative affectivity, Type A and locus of control: "If a case were to be made for any of these three as the fundamental underlying variable then negative affectivity would appear to be the strongest candidate" (p.228). Moreover, Payne (1988a) notes that research has found a consistently strong relationship between neuroticism and symptoms of strain. However, as he further points out, none of the studies cited in his article, had used a measure of neuroticism to explore its moderating effect on the stressor-strain relationship. Similarly, Moyle (1995) in a review of negative affectivity in stress research, cited very few studies in which measures of neuroticism or negative affectivity had been examined as a moderator of the relationship between stressors and strain. Therefore, given the evidence that neuroticism has a direct effect on symptoms of strain, but the absence of much evidence to support its role as a moderator variable, it may be of value to further explore the role of neuroticism in the prediction of strain.

The nature of the role of individual differences in the coping process is, however, somewhat controversial. The evidence that individual differences moderate the effects of coping behaviours is inconclusive (Carver, et al., 1989; Koeske et al., 1993; O'Driscoll & Cooper, 1994). As Carver et al. (1989) explain, there are two basic positions on the issue of individual differences in coping. The first, suggests that people prefer to use relatively . . . "stable coping styles or dispositions" for coping with stress;

that is, they . . . "bring to bear a preferred set of coping strategies that remain relatively stable across time and circumstances" (p. 270). The second, takes the position that personality traits determine the individual's approach to coping with stressful encounters, that is, that . . . "certain personality characteristics predispose people to cope in certain ways when they confront adversity" (p. 270). These two basic positions, Carver et al suggest, raise three particular research questions. Does the individual use similar coping strategies in their response to all stressors? If not, does this mean that either (a) coping strategies are not related to individual personality dispositions or (b) that in spite of this relationship, individual differences account for individual variability in their use of coping strategies.

Cox and Ferguson (1991) also suggest that coping itself may be seen to reflect the effect of individual differences (i.e., personality dispositions) in the approach individuals adopt to cope with stress. They suggest three possible relationships between coping and strain: (a) a direct relationship in which personality dispositions for coping are related to the tolerance for stress and symptoms of strain; (b) an indirect relationship in which personality dispositions influence (i.e., moderate) the choice and use of coping strategies; and (c) that coping itself moderates the stressor-strain relationship. Osipow and Davis (1988), for example, report a study which shows the moderating effect of recreational, physical (i.e., self-care), social support and rational/cognitive coping behaviours on the relationship between stressors and strain.

The principle aim of the present study was to further explore the relative effect of (a) expectancies assigned to physical and psychological strain (i.e., implicitly, a measure of the individual's hardiness); and (b) personal beliefs associated with the provision of social support (i.e., implicitly, by extension, expectancies related to the provision of social support) on the explained variance in symptoms of strain. The secondary aims

of the study were to explore the relative effect of (a) coping strategies, (b) dispositions for neuroticism, (c) the moderating effects of expectancies, beliefs, coping and neuroticism on symptoms of strain. In addition, it sought to further examine measures of physical, psychological and composite strain (see Appendix D.2). Based on the results from studies one, two and three and drawing on the cited research, the present study seeks to test the following explicit hypotheses:

H1 That expectancies assigned to the anticipated effect of physical and psychological symptoms of strain on work performance will explain additional variance in strain when placed in the presence of common work role stressors, beliefs associated with the provision of social support, coping strategies and dispositions for neuroticism.

H2 That personal beliefs associated with the provision of social support when required, needed or expected of the individual will add useful information to the explained variance in strain when placed in the presence of work role stressors, expectancies associated with well-being, coping strategies and dispositions for neuroticism.

H3 That individual differences in (a) expectancies for general health and psychological stress, (b) beliefs associated with the provision of social support, (c) coping strategies and (d) personality dispositions for neuroticism will moderate the relationship between predictors and symptoms of strain.

3.2.4.3 Method

3.2.4.3.1 Participants

A total of 135 youthworkers from five juvenile detention centres run by a state government Department of Juvenile Justice volunteered to take part in the study. Of these, 84% were employed as youthworkers, 14% as senior youthworkers and 1% as centre managers; 70% were male youthworkers and 28% female youthworkers. The average time for employment in youthwork was 3.8 years with a range of 0.2 to 23 years. The majority of youthworkers (i.e., n = 73) were aged between 21-36 years with a range of 21-36 years to over 55 years (i.e., n = 5) in age. Furthermore, 50% of the

sample reported that they were married, 24% as single, 8% as divorced, 13% as living with partners and 1.5% as widowed; in addition, 33% of the sample reported that they had no children, 14% one child and 50% two or more children.

3.2.4.3.2 Self-report Measurement

Self-report scales were used to measure (a) the recognition (i.e., description) of common work stressors; (b) strategies for coping; (c) the expectancies (i.e., personal meaning) attributed to the expected effect of physical and psychological strain on work performance; (d) beliefs associated with social relationships and the provision of social support; and (e) dispositions for neuroticism. In addition, self-report measures of physical and psychological strain were included in the inventory to measure the symptoms of strain more recently experienced by the participants in the present study (see Appendix D.3, Stress in Youthwork Survey).

3.2.4.3.2.1 Measurement of Common Work Stressors

Work stressor dimensions drawn from (a) the Ivancevich and Matteson (1980, 1984) Stress Diagnostic Survey (SDS) and (b) the work stressor dimensions identified by Dewe (1991a) were used to measure the frequency of work stressors common to the Youthworkers participating in the study (see Appendix D.3.1, Stress Diagnostic Survey). Specifically, the macro common work stressors "rewards" "participation" "underutilisation" and "supervisory style" dimensions of work stress; and the micro common work stressors "role-ambiguity" "role-conflict" "overload qualitative" "overload quantitative" "career progress" "responsibility for people" and "time pressure" work stressor dimensions from the SDS were considered to represent the more common sources of stress experienced by the sample. In addition, due to the poor face validity of the SDS "politics" scale, the "organisational conflict" scale from the dimen-

sions of common work stressors identified by Dewe (1991a) was used to measure facets of organisational politics" associated with youthworking. From these 12 dimensions of common work stressors, two of the four items from each of the respective scales were selected to form two item scales to measure the respective work stressor dimensions.

A "Yes" (3) "No" (0) and "Sometimes" (1) response format (see Chapter 3.2.2.3.2.1) was used to measure the participants perception of how frequently they experience the nature of the scale items. The response "Yes" reflecting a response of "Yes Always" see my job this way; "No" the response "No Never" see my job this way; and "Sometimes" a response of "Sometimes" may see my job this way.

The SDS inventory reports satisfactory internal consistency, test-retest reliabilities, and construct validity for the 15 stressor dimensions used in the inventory. Furthermore, interscale correlations between the scales in both the macro and micro dimensions are reported as low to moderate. As such, the scales may be seen to reflect only moderate levels of independence. The correlations between the macro scales ranging from 0.09 to 0.41; and those for the micro scales, from 0.16 and 0.46. Further, with respect to the Organisational Conflict scale, Dewe (1991a) reports that the internal consistency of the scale is moderate when used to measure work stressors in terms of either agreement (i.e., true-false), frequency, duration or demand; the alpha coefficients for the scale range from 0.70 - 0.73.

3.2.4.3.2.2 Measurement of Coping Strategies

The 10 item Recreational, Physical, Social Support and Rational/Cognitive Coping scales from the Osipow and Spokane (1983, 1987) OSI inventory were used to measure the coping strategies used by the participants to reduce stress (see Appendix D.3.4, Personal Resources and Demands Questionnaire). The Recreational scale (see Appendix

A.2.8, items 1 - 10) providing a measure of how often people make use of recreational activities to relax or derive pleasure; the Physical or Self-Care scale (see Appendix A.2.8, items 11 - 20), how often the person engages in activities such as exercise, sleep or relaxation techniques; the Social Support scale (see Appendix A.2.8, items 21 - 30), how frequently the person makes use of social support resources such as significant others, friends and social activities; and the Rational/Cognitive scale (see Appendix A.2.8, items 31 - 40), how often the person makes use of cognitive strategies such as blocking, problem solving and self-awareness to reduce stress. The OSI inventory reports satisfactory psychometric properties for the coping scales. In addition, the data from Study 1 shows that the alpha coefficients for the scales are generally moderate in nature; coefficients for the scales ranging between 0.65 for the Physical Coping scale to 0.83 for the Social Support scale. Further, interscale correlations indicate that the independence of the scales ranges from low to moderate; correlations between the scales ranging from 0.21** for recreational and social support coping to 0.46** for recreational and physical coping.

The individual's response to the coping scale items was measured using a frequency "Yes" (3) "No" (0) and "Sometimes" (1) response format (see Chapter 3.2.2.3.2.1). The response "Yes" referring to "this always" describes my behaviour; a response "No" that the item "does not" describe my behaviour; and a response "Sometimes" that the person "sometimes" behaves this way.

3.2.4.3.2.3 Measurement of Expectancies For General Health and Psychological Stress

Expectancies associated with the expected effect of general health and psychological stress on work performance was measured using a three item and five item scale respectively. The format and design of expectancy scales is described in detail in the

method section for Study 1 (see Chapters 3.2.1.3.2.4, 3.2.1.3.2.4.1 & 3.2.1.3.2.4.2). The items in the Expectancy Psychological Stress (see Appendix D.3.3) and Expectancy General Health (see Appendix D.3.7) scales were formed from items used in the Psychological and Physical Strain scales of the Occupational Stress Inventory (Osipow & Spokane, 1983, 1987). For example, the OSI Psychological Strain scale item "I find myself complaining about little things" was reworded to form the expectancy item "When I complain a lot, my supervisor and colleagues will not listen to me". Similarly, the Expectancy General Health scale item "A general feeling of being "off colour" - i.e., tiredness, irritability, depression, poor sleeping and anxiety etc, will affect my job performance and relationships at work" reflects a combination of items used in the OSI Physical Strain scale.

The participants response to items in the expectancy scales was measured using the response format "Yes" (3) "No" (0) and "Sometimes (1) (see Chapter 3.2.2.3.2.1). A response "Yes" indicating that it was "very likely" that the personal meaning of the item would influence the person's work relationships and/or job performance; a response "No" that it was "very unlikely" that the personal meaning of the item would influence the person's work relationships and/or job performance; and a response "Sometimes" that it was "sometimes likely" that the personal meaning of the item would influence the person's work relationships and/or job performance.

Results from previous studies have shown that expectancy scales tend to reflect moderate alpha coefficients for internal consistency. For instance, from the data for Study 1, the average alpha coefficient for the two item expectancy scales was a moderate 0.74; and for Study 2, a slightly lower average alpha coefficient of 0.67 from the use of five item expectancy scales.

3.2.4.3.2.4 Measurement of Beliefs Concerning Social Support Demands

The five item scale "Belief Social Support Demands" (see Appendix D.3.4, Personal Resources and Demands Questionnaire) was designed to tap the individuals personal beliefs (Folkman, 1984; Lazarus & Folkman, 1984) concerning demands associated with (a) their role in social relationships and (b) the provision of social support when either required, needed or expected of them (Coyne & DeLongis; 1986). Items in the scale were formed from items used in the Social Support Scale of the Osipow & Spokane (1983, 1987) OSI work stress inventory. For instance, the item "Letting others know that I love and care about them is demanding" was formed from the OSI item "There is a person with whom I feel really close".

The wording of items used in the belief scale draws heavily on the notion that subtle distinctions can be made between the use of descriptive questions (Frese & Zapf, 1988; O'Driscoll & Cooper, 1994), "appraisal questions" (Monroe & Kelley, 1995, p. 136) and the use of bipolar appraisal response scales to measure the personal meaning imputed to a scale item (Ajzen & Fishbein, 1980; Osgood et al., 1957). That is, the frame of reference for the individual's reaction to a scale item may be seen as embodied in either (a) the emotional nature of the item or (b) the emotional nature of the bipolar anchors used for a response scale (DeFrank, 1988; Freze & Zapf, 1988; Madden et al., 1990; Smith et al., 1969). For instance, the item "Being a member of a circle of friends is demanding" requires the individual to appraise the intent of the item; by contrast, the item "I belong to a circle of friends" may be seen as essentially descriptive in nature.

Furthermore, due to (a) the similarity of the items with the behavioural emphasis of items used in the coping scale and (b) the possibility that the participants may tend to agree with the stressful focus of the scale items (i.e., ". . . is demanding") if presented

as a separate scale, the belief items were dispersed throughout the coping scale (see Appendix D.3.4, Personal Resources and Demands Questionnaire). As a result, the "Yes" (3) "No" (0) and "Sometimes" (1) response format used for the coping scales was also used to measure the participants response to the "beliefs about social support" items.

3.2.4.3.2.5 Measurement of Neuroticism

Form B from the Eysenck Personality Inventory (EPI) was used to measure dispositions for neuroticism (Eysenck & Eysenck, 1964). As the authors note, there are two parallel forms to the 57 item EPI which measures the personality dimensions extraversion and neuroticism (i.e., emotionality) using 24 item scales (see Appendix D.3.8, Personality questionnaire). In addition, there is a nine item "lie scale" included in each form which may be used to detect and eliminate individuals who "fake" their responses to the EPI items (i.e., respond to the items in the desirable direction). However, for the requirements of the present study, only the measure of neuroticism was included in the measurement model. For example, the traits "calm" "reliable and "controlled" are indicative of a "stable" orientation; and the traits "moody" "anxious and "rigid" as representing high emotionality or an unstable personality disposition.

The EPI neuroticism scale has been widely used in psychological research (Bartram, 1995; Bohle, 1997; Moyle, 1995) and thereby widely seen as a useful measure of personality characteristics. The EPI reports satisfactory test-retest and split-half reliabilities for the scales and interscale correlations which indicate the orthogonal nature of the scales. Participants reported their response to the EPI items using the standard EPI "Yes" "No" response format.

3.2.4.3.2.6 Measurement of Symptoms in Strain

The multidimensional 20 item Personal Health scale (see Appendix D.3.6) was used to measure how often the participants suffer from symptoms of physical strain (Osipow & Spokane, 1983; Smith & Bennett, 1983). In addition, the 10 item Psychological Strain scale (see Appendix D.3.2) from the OSI inventory was used to measure the frequency of psychological symptoms of strain more recently experienced by the participants (Osipow & Spokane, 1983,1987). Furthermore, a 30 item Composite Strain scale may also be formed from the items used in the Personal Health and Psychological Strain scales.

Participants used a three point response format "Yes" (3) "No" (0) and "Sometimes" (1) to measure their response to the items used in the Personal Health and Psychological Strain scales. Chapter 3.2.2.3.2.2 provides a more detailed description of the response format, psychometric properties and content of the Personal Health, Psychological Strain and Composite Strain scales.

3.2.4.3.3 Design and Materials

This correlational field study required participants to answer an inventory with seven questionnaires and a total of 115 items. In addition, the 57 item EPI (Form B) was included at the rear of the questionnaire and offered as an optional task for participants. Thus, overall, there was a total of 8 questionnaires and 172 items in the questionnaire presented to participants. Furthermore, due to the reasonable length of the question naire and volunteer participants, problems such as mental fatigue, boredom with the task and carry-over effects were not expected to adversely influence the responses to the scale items.

3.2.4.3.4 Procedure

Following approval from the Department of Juvenile Justice and the briefing of Unit Psychologists on the nature of the research and the content of the questionnaires, the questionnaires were distributed to the Unit Psychologists at the respective Juvenile Detention Centres. Unit Psychologists then distributed the questionnaires to Youthworkers in attendance at their weekly debriefing and personal development meeting. The Unit Psychologists informed the Youthworkers that the research was concerned with stress at work and given a brief explanation of the inventory. They were then asked if they would participate in the research and volunteers asked to complete the inventory when able and return the completed questionnaires to the Unit Psychologist. The completed questionnaires were then returned to a central unit and from there to the researcher. Using this method, 135 youthworkers employed in five Juvenile Detention Centres returned completed questionnaires to their respective Unit Psychologist. Response rates from the five centres were relatively consistent and ranged from 63.0% to 70.0%. Overall, from the distribution of 200 questionnaires, a response rate of 67.5% from the youthworkers employed in the Juvenile Detention Centres.

3.2.4.4 Results

3.2.4.4.1 Data Screening and Assumptions for Normality

Descriptive statistics, frequency plots and a series of multiple regression analyses were used to screen the raw data (n = 135) for evidence of (a) non-random missing values, (b) violation of the assumptions for normality and linearity and (c) the presence of univariate and multivariate outliers in the data set (Brown & Di Milia, 1995; Orr et al., 1991; Tabachnick & Fidell, 1989).

With the exception of missing values for the EPI scale (i.e., variables 116 - 172), there was only a small number of missing values evident in the raw data set. Specifically, on average, there were 0.30 missing values per variable across the variables 1 to 115 with a maximum of three for the "sex" "marital status" and "no of children" biographical questions. The missing values were subsequent replaced with the scale response value (i.e., 3 or 1) closest to the mean value for the variable.

For the EPI questionnaire, however, there was a large number of missing values for the 57 items in the scale; eleven participants failed to answer the questionnaire and five returned nine or more missing values in their response to the items in the EPI. Further investigation revealed that ten of the eleven participants who failed to complete the EPI came from the same detention centre and those with nine or more missing values from two other centres. However, it is unlikely that these non-respondents were different from those who responded to the EPI. What appears to be the case is that at these three centres, the unit psychologists who presented the survey to the youthworkers were understood as indicating that not only was completion of the EPI optional, but also that it was not necessary for the main body of the research.

One obvious solution to the missing neuroticism data, was to discard cases with missing values greater than two (i.e., 16 cases). However, to do so, results in the loss of information from other scales which would otherwise normally contribute to the direction and significance of the omnibus effects in the model (Tabachnick & Fidell, 1989). Therefore, as a means to retain all the cases in the measurement model, two methods were used to substitute the missing values with mean values (Tabachnick & Fidell, 1989). For the eight cases with two or less missing values, the response value closest to the mean for the variable replaced the missing value. While, for the 16 cases with more than two missing values, the missing values were initially recoded to zero and then (a)

in the case of Cronbach Alpha analyses deleted from the analysis, or (b) for the series of frequency, correlation and regression analyses, replaced with the mean value for the scale obtained from cases with valid data (i.e., 118 cases).

Frequency plots explored the normality of the variables used in the measurement model. Where necessary univariate outliers and values distant from the general distribution were recoded to values less distant from the next most deviant value in an attempt to improve the normality of the data distribution (Tabachnick & Fidell, 1989). Variables with extreme skew coefficients (see Appendix D.1.1, Table D.1) were then transformed to normal distributions using square root transformations of the data.[2]

In addition, a series of regression analyses explored the data for evidence of multivariate outliers. From these analyses three cases was identified as a multivariate outliers and therefore removed from the data set. The remaining 132 cases in the data set provide the desired power of 0.80 at α 0.05 (Two Tailed) with which to detect a significant medium effect size (ES) of 0.15 from the effect of $k = 12$ independent variables (IV's) in a multiple regression model (see Cohen & Cohen, 1983, p. 118).[3] Specifically, to achieve the desired statistical power, requires a minimum of 129 cases. Furthermore, the case to IV ratio of 11.25:1 exceeds the requirement for a minimum of five cases to each IV in multiple regression analyses (Tabachnick & Fidell, 1989).

---

[2] See footnote 1, Chapter 3.2.2.5.1 re values for skewness. This study has adopted a more conservative approach to normality and used an alpha level of .023 to determine maximum skewness. Skew coefficients greater than two SE's (i.e., 0.422) were considered to reject the null hypothesis for skewness.

[3] See footnote 2, Chapter 3.2.2.5.1 for a discussion on the calculation of desired power for single set multiple regression analyses.

3.2.4.4.2 Descriptive Statistics

Descriptive statistics (n = 132) for the scale means, standard deviations (SD's), scale response range, skewness and internal consistency (i.e., Cronbach alpha coefficients) are presented in Appendix D.1.1

3.2.4.4.2.1 Factor Work Role Stressor Scales

The three factor solution from a factor analysis of the 24 item stressor scale is presented in Appendix D.1.1.1; and descriptive statistics for the Factor Work Role Stressor scales in Appendix D.1.1.2.

3.2.4.4.3 Scale Correlations

Pearson zero-order correlations (n = 132) for the SDS stressor scales with dimensions of strain are shown in Table 3.2.4.1; and correlations for the work role stressor, coping, beliefs, expectancy and neuroticism scales with dimensions of strain in Table 3.2.4.2. Furthermore, the sample size n = 132 provides a desired minimum power of 0.80 at α 0.05 (Two Tailed) with which to detect a medium ES of r = 0.30. As the tables for power provided by Cohen (1992) indicate, to detect a medium ES or population r of 0.30 at α 0.05 (Two Tailed) requires a minimum sample size of n = 85 (see Table 2, p. 158) to achieve a minimum power of 0.80. The correlations reflect two-tailed tests for significance at $\alpha \leq 0.05$* or 0.01** as indicated.

SDS Stressor Scale Correlations With Strain

Correlations between the SDS scales and Physical Strain are not significant (see Table 3.2.4.1). Similarly, correlations with the Psychological and Composite Strain scales are by and large either low or not significant. For instance, only six of the SDS scales show a significant correlation with Psychological Strain and range between 0.20* for the Role-Conflict scale to a maximum of 0.35** for the Career Progress scale. While for

the correlations with the Composite Strain scale, only Career Progress (i.e., r = 0.23**) and Organisational Politics (i.e., r = 0.21*) show significant correlations with the composite scale.

Correlations between the SDS scales, however, reveal a substantial number of significant low to moderate correlations which show no distinct groupings. For example, Supervisory Style correlates significantly with eight of the SDS scales; Role-Ambiguity with nine of the SDS scales; Role-Conflict with seven of the other scales; and the Overload Quantitative/Qualitative scales with eight of the other SDS scales. Thus, taken overall, there is a tendency for multicollinearity or redundancy among the SDS scales.

Table 3.2.4.1
Correlations: Common SDS Work Stressors With Dimensions of Strain

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13
Stressor													
1. Rewards	----												
2. Participation	.28**	----											
3. Underutilisation#	.34**	.31**	----										
4. Supervis Style#	.38**	.34**	.33**	----									
5. Role-Ambiguity#	.21*	.08	.21*	.19*	----								
6. Role-Conflict	.23**	.11	.02	.17	.36**	----							
7. O'Load Quant#	.22**	.16	.09	.24**	.18*	.43**	----						
8. O'Load Qual#	.07	.25**	.15	.27**	.20*	.07	.27**	-----					
9. Career Progress	.17	.14	.03	.37**	.26**	.18*	.27**	.31**	----				
10. Responsibility#	.17	.10	-.09	.12	.30**	.35**	.34**	.22*	.35**	----			
11. Time Pressure#	.10	.06	-.03	.14	.25**	.45**	.62**	.26**	.13	.33**	----		
12. Organ. Politics	.13	.17	.22*	.25**	.16	.38**	.26**	.05	.14	.23**	.20*	----	
13. Stressor Comp+	.51**	.45**	.38**	.56**	.54**	.62**	.64**	.45**	.52**	.56**	.54**	.53**	-----
Strain													
14. Physical#	01	.06	-.04	-.06	-.00	.06	.05	.04	.10	.02	.06	.12	.07
15. Psychological#	.11	.16	.07	.16	.12	.20*	.27**	.18*	.35**	.24**	.23**	.23**	.37**
16. Strain Comp#	.07	.11	.00	.02	.06	.15	.17	.12	.23**	.14	.16	.21*	.24**

Note: n = 132; *p. ≤ .05, **p. ≤ .01 (Two-Tail); #Transformed Scale; Stressor Comp+ - Formed from Sum of Sub-Scales.

Work Role Stressor Scale Correlations

Correlations with the Physical Strain scale are not significant and likewise correlations between the Role-Insufficiency scale and the dimensions of strain are not significant (see Table 3.2.4.2). In contrast, the Role-Boundary and Role-Overload scales correlate

respectively 0.32** and a lower 0.23** with the Physical Strain scale; a similar, 0.32** and 0.23** with the Composite Strain scale; and the Work Role Composite scale, a slightly higher 0.37** and 0.24** with the psychological and composite measures of strain.[4] The 95% confidence interval for the underlying correlations in the population (i.e., 0.17 to 0.42, sample size n = 200 and observed correlation of r = 0.30) verify the significance of the correlations with strain (Skinner, 1884).

Correlations between the work role stressor scales are either low or not significant with a maximum correlation of 0.38** between the boundary and overload scales. As a result, the scales may be seen to represent relatively independent work stressor dimensions. Similarly correlations with the coping, belief, expectancy and neuroticism scales are either low or by and large not significant; the range of the significant correlations ranging from a minimum 0.18* to a maximum of 0.30** between the Role-Overload scale and Physical Coping scale. Thus, due to their minimal overlap with these scales, the work role stressor scales may be seen as relatively independent predictors of symptoms in strain.

Coping Scale Correlations

Recreational, physical and rational/cognitive coping reflect moderate and significant inverse relationships with physical, psychological and composite dimensions of strain. recreational coping correlates an inverse -0.54** with the Composite Strain scale; physical coping -0.51**; rational/cognitive coping, a slightly higher -0.56**; and the composite measure of coping, an increased -0.64** with the Composite Strain scale. In contrast, social support coping correlates a low but significant inverse -0.24** with the

[4] Note: Although the correlations for the Role-Overload and Strain scales are based on transformed scales, the sign for the respective correlations does not change.

Physical Strain scale; a not significant -0.13 with the Psychological Strain scale; and a low -0.21* with the Composite Strain scale.[5] In other words, the inverse correlations imply that increases in the frequency of the use of the respective coping strategies is related to a decrease in the frequency of physical and psychological symptoms of strain.

With the exception of the correlation between social support and rational/cognitive strategies for coping (i.e., 0.12 ns), the positive correlations between the coping strategies tend to be moderate and significant at the 0.01 level of significance. The correlations range from a minimum 0.25** to a maximum of 0.49** between recreational and physical coping. Therefore, in terms of conceptual independence, there is evidence of moderate confounding or some redundancy among the coping scales. However, when the correlations are seen in functional terms, they suggest that coping behaviours are by necessity, rather than discrete "this" or "that" choices, interlinked when used in the process of adjustment to a stress experience. For instance, the correlations between recreational and physical coping (i.e., 0.49**), social support coping (i.e., 0.40**) and rational/cognitive coping (i.e., 0.41**) imply a functional overlap between coping behaviours.

The correlation between social support and rational/cognitive coping, is not significant. This suggests that the use of social support by this sample is not directly related to the use of rational/cognitive appraisals but rather may in effect be used to underpin or operationalise the utility of recreational and physical coping behaviours. In short, it implies that this sample does not employ social support strategies per se to reduce

---

[5] Due to the square root transformation of the social support scale, correlations with the Social Support scale are reversed from negative to positive. For the purpose of consistency in the presentation of the results, the sign of the correlation is reversed to reflect the direction of the original correlation.

stress; but may instead, use recreational and physical coping strategies as the means to acquire or attract the necessary social support to reduce the stressful experience. Alternatively, it may be the case that rational/cognitive coping is largely a non-social method of coping that depends on the exclusive use of cognitive strategies to reduce stress.

Although significant at the 0.01 level of significance, correlations between the coping scales and Beliefs Social Support Demands scale are low and indicate an inverse relationship between the scales. For instance, rational/cognitive and recreational coping correlate -0.27** with the belief scale and social support -0.23** (see footnote 5) with the beliefs scale. As such, they imply that increases in the use of coping behaviours are used to reduce the demands associated with the provision of social support to others. In contrast, with the exception of the inverse -0.30** correlation between rational/cognitive coping and the Expectancy Psychological Stress scale, the correlations between the coping scales and the expectancy Psychological Stress and General Health scales are not significant. The Composite Coping scale, however, correlates a low and inverse -0.28** with the Expectancy Composite scale and suggests that coping behaviours are used to reduce the expected effect of psychological and physical symptoms of strain on work relationships and job performance.

Neuroticism correlates both significantly and negatively with all of the coping scales except social support. For instance, rational/cognitive coping correlates an inverse -0.46** with neuroticism and the composite measure of coping, an inverse -0.45** with neuroticism. Conversely, the 0.14 correlation between social support coping and neuroticism is not significant. This suggests that the use of social support by this sample to cope with stress is not significantly influenced by dispositions for neuroticism.

Belief Scale Correlations

The correlations between the Belief Social Support Demands scale and dimensions of strain tend to be moderate and reflect positive relationships. For instance, the belief scale correlates a positive 0.47** with the physical scale and a similar 0.47** with the composite measure of strain. Further, correlations between the belief and expectancy scales tend to be low or not significant; it correlates 0.29** with the Expectancy Psychological Stress scale, a not significant 0.14 with the Expectancy General Health scale and 0.28** with the Composite Expectancy scale. As a result, the belief and expectancy scales may be seen as relatively independent dimensions of cognitive appraisal. In addition, the belief scale correlates a moderate and positive 0.47** with the neuroticism scale. That is, it implies that there is perhaps a positive relationship between dispositions for neuroticism (i.e., emotionality) and the belief that the provision of social support is demanding.

Expectancy Scales Correlations

Although in the main significant, the correlations between the expectancy scales and dimensions of strain are low. Expectancies related to psychological symptoms of stress correlate a positive 0.28** with the Composite Strain scale; expectancies attributed to general health complaints a reduced 0.19* with the composite scale; and the seven item composite measure of expectancies, a low 0.29** with the Composite Strain scale. In addition, the low 0.36** correspondence between the expectancy scales indicates that the scales may be seen as relatively independent in nature. Furthermore, the correlations between the expectancy scales and neuroticism are all significant at the .01 level of significance. They range from a minimum of 0.25** for the correlation between neuroticism and general health expectancies, to a maximum of 0.39** with the Composite Expectancy scale.

Table 3.2.4.2
Correlations: Work Role Stressor, Coping, Belief Social Support, Expectancy, Neuroticism and Strain Scales

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Work Role Stressor																
1. Role-Boundary	----															
2. Role-Insufficiency	.22**	----														
3. Role-Overload*	.38**	.14	----													
4. Composite Work Role	.73**	.55**	.80**	----												
Coping																
5. Recreational	-.18*	-.07	-.11	-.16	----											
6. Physical	-.18*	.06	-.30**	-.26**	.49**	-----										
7. Social Support#	-.05	.03	.09	.08	-.40**	-.25**	----									
8. Rational/Cognitive	-.18*	.05	-.17*	-.17*	.41**	.37**	-.12	----								
9. Composite Coping	-.22**	-.01	-.24**	-.25**	.81**	.73**	-.60**	.67**	----							
Beliefs																
10. Soc. Supp. Demands#	.05	.20*	.16	.19*	-.27**	-.24**	.23**	-.27**	-.35**	----						
Expectancy																
11. Psychological Stress#	.22*	-.01	.19*	.21*	-.13	-.11	.01	-.30**	-.17	.29**	----					
12. General Health	.07	.00	-.06	-.02	-.15	.00	-.10	-.14	-.05	.14	.36**	----				
13. Composite Expect.	.16	-.01	.09	.12	-.20*	-.09	-.03	-.27**	-.16	.26**	.82**	.80**	----			
Dispositional																
14. Neuroticism	.18*	-.07	.06	.08	-.39**	-.28**	.14	-.46**	-.45**	.47**	.36**	.25**	.37**	----		
Strain																
15. Physical#	.09	-.05	.09	.07	-.49**	-.41**	.24**	-.44**	-.55**	.47**	.26**	.23**	.31**	.60**	----	
16. Psychological#	.32**	.10	.32**	.37**	-.45**	-.45**	.13	-.63**	-.60**	.39**	.30**	.11	.25**	.49**	.56**	----
17. Composite Strain#	.23**	.00	.23**	.24**	-.54**	-.51**	.21*	-.56**	-.64**	.47**	.28**	.19*	.30**	.59**	.90**	.84**

Note: n = 132; *p ≤ .05, **p ≤ .01 (Two-Tail); Comp: Composite Scale From Sum of Sub-Scales; #Transformed Scale.

Although the focus of items used in the expectancy (i.e., job performance) and strain (i.e., self) scales is different, the wording of the items in the expectancy scales is, to some extent similar to the respective items in the strain scales. This qualitative assessment of the scales suggests that there may well be a semantic overlap (i.e., carry-over effect) between the respective items which subsequently acts to inflate the correlations between the expectancy and strain scales (see Appendix A.2 for a discussion on this issue). For instance, the psychological strain item "I find myself complaining about little things" is, to some extent, similar to the expectancy item "When I complain a lot, my supervisor and colleagues will not listen to me".

However, when the scales are assessed in quantitative terms, the relationship between the expectancy items and the Physical, Psychological and Composite Strain scales is, it would seem, not inflated. As evident from Table 3.2.4.3, correlations between the expectancy items and the strain scales are either low or not significant. The significant correlations ranging between a minimum of 0.17* to a maximum of 0.32**. The highest occurring between item five "When I am worried, I will not be able to concentrate on my work properly" and the Composite Strain scale. Thus, on the basis of these correlations, there is no evidence of any exaggerated correspondence or inflated overlap between the expectancy items and dimensions of strain.

Neuroticism Scale Correlations

Correlations between the neuroticism and the strain scales are in the positive direction and moderate to high in nature. It correlates a high 0.60** with physical symptoms of strain; a reduced and moderate 0.49** with psychological symptoms of strain; and a

high 0.59** with the composite measure of strain symptoms. In other words, the correlations imply that there is perhaps a positive relationship between increases in the orientation for neuroticism (i.e., emotionality) and increases in symptoms of strain.

Table 3.2.4.3
Item-Scale Correlations: Expectancy Psychological Stress and Expectancy General Health Scale Items With Dimensions of Strain

Scale	1	2	3	4	5	6	7	8
Expect Psych Stress								
1. Item 1	----							
2. Item 2	.56**	----						
3. Item 3	.52**	.57**	----					
4. Item 4	.19*	.17*	.30**	----				
5. Item 5	.49**	.60**	.52**	.37**	----			
Expect Gen Health								
6. Item 1	.40**	.51**	.35**	.06	.37**	----		
7. Item 2	.24**	.26**	.17	-.06	.20*	.57**	----	
8. Item 3	.24**	.23**	.12	-.01	.21*	.51**	.73**	----
Strain								
9. Physical#	.17*	.15	.34**	.02	.30**	.28**	.17	.15
10. Psychological#	.16	.24*	.24**	.10	.30**	.27**	.03	-.01
11. Composite Strain#	.18*	.18*	.31**	.05	.32**	.29**	.11	.09

Note: n = 132; *p ≤ .05, **p ≤ .01 (two-tail); # Transformed Scale.

Strain Scale Correlations

Correlations between the strain scales range from moderate to high. The 0.56** correspondence between the physical and psychological scales suggests that these scales are relatively independent dimensions of strain. In contrast, the high correlations between the physical (i.e., 0.90**) and psychological (i.e., 0.84**) scales and the Composite Strain scale indicate that the scales are essentially multicollinear in nature. Thus, whilst the physical and psychological scales may be seen as relatively independent in nature, there is a sufficient relationship between the scales to suggest that the Composite Strain scale is the preferred measure of strain

3.2.4.4.3.1 Transformed Scale Correlations

A comparison of the transformed predictor scales with the original and transformed strain scales is shown in Table 3.2.4.4. As evident from the table, the transformation of significantly skewed distributions to approximate normal distributions may not necessarily increase the correlations with dimensions of strain. For instance, the correlation for the transformed Role-Overload scale decreases from 0.33** to 0.32** when related to psychological strain; and from 0.24* to 0.23* when correlated with the composite measure of strain.

Table 3.2.4.4
Correlation Comparison: Transformed Work Role Stressor, Coping, Belief Social Support and Expectancy Scales With Original and Transformed Strain Scales

Transformed Scales	Strain Scales: Physical		Psychological		Composite	
	Orig+	Trans+	Orig	Trans	Orig	Trans
Work Role Stressor						
Role-Overload#	.10	.10	.33**	.32**	.24*	.23*
Coping						
Social Support#	.25*	.24*	.13	.13	.21*	.21*
Beliefs						
Social Support Demands#	.43**	.47**	.36**	.39**	.45**	.47**
Expectancies						
Psychological Stress#	.25*	.26*	.31**	.30**	.29**	.28*

Note: n = 132; *p ≤ .05, **p ≤ .01 (two-tail); Orig+ = Correlation With Original Stressor Scale; Trans+ = Correlation With Transformed Stressor Scale; # Transformed Scale

The correlations for the transformed belief scale, however, each show a marginal increase when related to the transformed strain scales. For example, the correlation with the composite scale increases from 0.45** to 0.47**; that is, it provides an increase in the variance explained by the correlation from 20.25% to 22.09%.

3.2.4.4.4 Regression Analyses

Tables 3.2.4.5 to 3.2.4.11 summarise the results from a series of backward regression, hierarchical modelling and moderator regression analyses which (a) explore the relative effect of common work role stressors (i.e., recognition of common stressors), coping behaviours, beliefs, expectancies and neuroticism on dimensions strain; (b) identify the model of best fit from the variables in the measurement model; (c) identify the theoretical importance and test the incremental effect of expectancy and/or belief demands when placed in the presence of significant neuroticism, work role stressor and coping variables; (d) identify the incremental effect of interaction terms when placed in the presence of the associated moderating and main effect terms. In addition, Figures 3.2.4.1 to 3.2.4.8 further illustrate the moderating effect of significant moderator terms on symptoms of strain. For each regression model, an alpha pout at ≥ 0.051 (Two Tailed) is used to (a) effect the removal of a variable from the regression model or (b) interpret the data in the equations for hierarchical models.

Table 3.2.4.5 shows the results from a series of baseline models which explored the effect of (a) common work role stressors; (b) expectancies related to psychological and general health symptoms of strain; (c) beliefs concerning social support demands; (d) coping behaviours; and (e) dispositions for neuroticism on symptoms of composite strain. Tables 3.2.4.6 and 3.2.4.7, the results from a series of model building backward regression analyses which explored the relative effect of significant work role stressor, belief and expectancy scales on composite strain (results related to physical and psychological strain are shown in Appendix D.1.2.1, Tables D.4 & D.5). Table 3.2.4.8, the results from a further model building regression analysis which explored the relative effect of significant coping behaviours when in the presence of significant work role

stressor, belief and expectancy scales on composite symptoms of strain (results related to physical and psychological strain are shown in Appendix D.1.2.2, Table D.6). Table 3.2.4.9, the results from a series of best fit regression models which sought to identify (a) the relative effect of neuroticism when included in the model; and (b) the model of best fit (i.e., most parsimonious explanation for the symptoms of strain reported by the sample) from the relative effect of the significant predictors identified in the baseline analyses.

In addition, Table 3.2.4.10 presents the results from a hierarchical analysis which sought to test the theoretical importance and identify the incremental effect of beliefs related to social support demands on the variance in composite strain when placed in the presence of significant neuroticism, work role stressors and coping variables (results for physical and psychological strain are shown in Appendix D.1.2.3, Tables D.7 and D.8). Finally, Table 3.2.4.11 shows the results from a series of moderator analyses which identified significant moderating effects on physical, psychological and composite measures of strain. In addition, Figures 3.2.4.1 to 3.2.4.4 illustrate the moderating effect of significant moderator terms on the relationship between predictors and strain from analyses based on transformed scales; and Figures 3.2.4.5 to 3.2.4.8, for explanatory purposes only, the moderating effect of significant moderator terms on the linkage between predictors and strain from analyses based on the original (i.e., non-transformed) scales.

3.2.4.4.4.1 Baseline Analyses

From the three scales in the work role stressor model (see Table 3.2.4.5), the six item Role-Boundary scale is the only scale which contributes useful information to the explanation of strain; it explained a rather low 5.19% (4.46% adj) of the variance in

symptoms of strain.[6] Whereas for the expectancy model, from the two expectancies scales in the model, the Expectancy Psychological Stress scale is the only significant predictor of strain. It explained a slightly higher 7.89% (7.19 adj) of the variance in symptoms of strain. In contrast, the Composite Expectancy scale explains an increased 8.96% (8.26 adj) of the variance in symptoms of strain; that is, the combined effect of the expectancy items adds 1.07% (adj) to the 7.19% (adj) explained by the Expectancy Psychological Stress scale.

In comparison to the expectancy models, the result for the belief model indicates that the effect of beliefs associated with social support demands explained a moderate 22.06% (21.46% adj) of the variance in composite strain. The effect of coping behaviours on the variance in composite strain, however, is more substantial. The cumulative effect of coping explains a high 47.20% (45.96% adj) of the variance in composite strain. As the table shows, the use of rational/cognitive, recreational and physical coping behaviours contributes significant information to the explained variance in composite strain; the use of social support coping, however, does not. Finally, from the result for the dispositional model, the effect of neuroticism explained a moderate 34.88% (34.38% adj) of the variance in symptoms of composite strain.

Perhaps the more important finding and relevant to the conceptual position of this thesis, the result for coping shows that the magnitude of the frequency of a coping behaviour (see Appendix D.1.1, Table D.1) does not necessarily indicate that coping

[6] Note: Although not shown in the table, when related to the Physical Strain scale, there was no significant effect from work-role stressors on physical strain. When related to Psychological Strain scale, however, Role-Boundary (t = 2.691, signif t = .0081) and Role-Overload (t = 2.568, signif t = .0114) work-role stressors explained 14.74% (13.42% adj) of the variance.

behaviour is a significant predictor of strain. As the table shows, although social support coping is the most frequent coping strategy (i.e., mean 24.227, SD 5.540), it fails to function as significant predictor of strain. Conversely, even though physical coping is the least frequent method of coping (mean 11.280, SD 5.822), it does, nonetheless, contribute significant information to the variance in strain explained by the model.

Table 3.2.4.5
Backward Regression: Baseline Models - Composite Strain on Work Role Stressor, Expectancy, Belief, Coping and Neuroticism Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Work Role Stressor	Role-Boundary	5.19%	4.46%	0.2278	2.667	.0086
Mult R=.2278; SE 1.0878; F(1,130) 7.1129, p. 0086						
Expectancy Scales	Expectancy Psyc Stress#	7.89%	7.19%	0.2810	3.338	.0011
Mult R=.2810; SE 1.0722; F(1,130) 11.1420, p. 0011						
Expectancy Composite	Expectancy Composite	8.96%	8.26%	0.2994	3.577	.0005
Mult R=.2994; SE 1.0659; F(1,130) 12.7959, p. 0005						
Beliefs (Social Support)	Social Support Demands#	22.06%	21.46%	0.4697	6.067	.0000
Mult R=.4697; SE 0.9863; F(1,130) 36.8025, p. 0000						
Coping	Rational Cognitive	47.20%	45.96%	-0.3529	-4.899	.0000
	Recreational			-0.2770	-3.617	.0004
	Physical (Self-Care)			-0.2458	-3.261	.0014
Mult R=.6870; SE 0.8181; F(1,128) 38.1399, p. 0000						
Dispositional	Neuroticism	34.88%	34.38%	0.5906	8.344	.0000
Mult R=.5906; SE 0.9015; F(1,130) 69.6238, p. 0000						

Note: pout ≥ .051 (two-tail); #Transformed Scale; Composite Strain - Transformed Scale

3.2.4.4.4.2 Model Building Analyses: Role Stressor, Expectancy and Belief Scales

Tables 3.2.4.6 and 3.2.4.7 show the results from analyses which explored the relative effect of significant work role stressors, expectancy and belief scales identified in the baseline analyses on composite measures of strain. Those shown in Table 3.2.4.6 reflect the effect of the Expectancy Psychological Stress scale in the respective models; and the results in Table 3.2.4.7, the effect of the Composite Expectancy scale in the respective models.

As the results in Table 3.2.4.6 show, the relative effect of the Belief Social Support and Role-Boundary scales explain a moderate 25.30% (24.14% adj) of the variability in the composite measure of strain. Moreover, as shown in the solution for the model and similarly those for the physical and psychological strain models (see Appendix D.1.2.1, Tables D.4 and D.5), the relative effect of beliefs associated with social support demands is (a) the dominant predictor in each model and (b) the only common predictor of strain across the regression models. Furthermore, these results further highlight the relative importance and significant involvement of appraisal processes in the stress process and the translation of stress to symptoms of strain

Table 3.2.4.6
Backward Regression: Composite Strain on Significant Work Role Stressor, Expectancy Psychological Stress and Belief Social Support Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Comp Strain#	Belief Social Support#	25.30%	24.14%	0.4394	5.694	.0000
	Role-Boundary			0.1823	2.363	.0196

Mult R=.5030; 0.9693; F(2,129) 21.8411, p. 0000

Note: pout, ≥ .051; #Transformed Variable; Composite Strain - Transformed Scale

The results in Table 3.2.4.7 further illustrate the relative importance and involvement of belief and expectancy appraisal processes in the transactional process of stress. In addition, they show the benefit of using a more general measure of appraisal (i.e., Composite Expectancy scale) to explain the relationship between personal demands and symptoms of strain. As the table shows, the Composite Expectancy scale contributes useful information to the explained variance in Composite Strain when in the presence of both belief social support and common work role demands (results for physical and psychological strain are shown in Appendix D.1.2.1, Table D.5).

Furthermore, the table indicates that the composite strain model explains a moderate 28.31% (26.62% adj) of the variance in composite strain from the relative effect of belief, expectancy and role-overload demands. Moreover, when the results are compared to those in Table 3.2.4.9, the relative effect of the Composite Expectancy scale in the model adds an additional 3.01% (2.48% adj) to the 25.30% (24.14% adj) of the variance in composite strain explained by the Belief Social Support and Role-Boundary scales. Thus, on the basis on these results, the Expectancy Psychological Stress scale was eliminated from subsequent model building analyses.

Table 3.2.4.7
Backward Regression: Composite Strain on Significant Work Role Stressor, Composite Expectancy and Belief Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
	Belief Social Support#			0.3936	5.018	.0000
Comp Strain #	Composite Expectancy	28.31%	26.62%	0.1800	2.318	.0221
	Role-Overload#			0.1735	2.284	.0240

Mult R=.5320; SE 0.9533; F(3,128) 16.8444, p. 0000

Note: pout, ≥ .051; #Transformed Variable; Composite Strain - Transformed Scale

3.2.4.4.4.3 Model Building Analyses: The Relative Effect of Coping Behaviours

Table 3.2.4.8 shows that the inclusion of significant coping behaviours in the composite strain model effects a substantial increase in the explained variance (results for physical and psychological strain are shown in Appendix D.1.2.2, Table D.6). As the results show, the model explains an increased and high 53.60% (52.14% adj) of the variance in composite strain from the relative contribution of rational/cognitive, physical and recreational coping behaviours in the model. Further, as indicated in the solution, the negative Beta coefficients depict the mediating effect of coping behaviours on symptoms of strain. In addition, it indicates that the effect of (a) rational/cognitive coping and

(b) beliefs associated with social support demands contribute useful information to the explained variance in composite strain. That is, the solution further illustrates the prominent and significant role of appraisal processes in the stressor to strain process. Conversely, the recognition of role-boundary work stressors and the expectancy of common work stressors were not significant predictors of strain in the model. As a result, these scales were eliminated from subsequent models.

Table 3.2.4.8
Backward Regression: Composite Strain on Work Role Stressor, Composite Expectancy, Belief Social Support and Coping Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Composite Strain#	Rational Cognit Coping	53.60%	52.14%	-.3070	-4.472	.0000
	Social Support Demands#			.2688	4.187	.0001
	Recreational Coping			-.2359	-3.244	.0015
	Physical Coping			-.2174	-3.051	.0028

Mult R=.7322; 0.7699; F(4,127) 36.6822, p. 0000

Note: pout, ≥ .051; #Transformed Variable; Composite Strain - Transformed Scale

In addition, when compared to the cumulative effect of the work role, expectancy and belief sources of demand (i.e., see Table 3.2.4.7), the relative effect of coping behaviours adds 25.30% (25.52% adj) to the variance explained by the model. Equally important, the results reveal the benefits of adopting a composite or less specific approach to the measurement of strain. As the results show, when compared to the variance explained by the physical strain model (i.e., 38.91% adj - see Appendix D.1.2.2, Table D.6) the composite strain model accounts for an additional 13.29% (13.23% adj) of the variance in symptoms of strain.

3.2.4.4.4.4 Models of Best Fit

The relative effect of dispositions for neuroticism when included in the physical, psychological and composite strain models is shown in Table 3.2.4.9. In addition, the respective solutions identify the models which provide the most parsimonious explanation for the variability in the symptoms of strain reported by the sample. That is, they represent the model of best fit from the variables in the measurement model. Furthermore, the solutions for each model provide the basis for hierarchical models which sought to test the theoretical importance and incremental effect of significant expectancy and/or belief predictors of strain.

The Relative Effect of Neuroticism

As evident from the table, the relative effect of neuroticism adds useful information to variance in strain explained by the physical and composite strain models. That is, from the inclusion of neuroticism in the respective models, the physical strain model explains an increased 48.87% (47.26% adj) of the variance in physical symptoms of strain; and the composite strain model, a substantially higher 58.24% (56.59% adj) of the variance in symptoms of strain. Thus, in comparative terms, the physical strain model adds

8.56% (8.35% adj) to the 40.31% (38.91% adj) explained by the respective coping model; and the composite strain model, an additional 4.64% (4.45% adj) beyond the 53.60% (52.14% adj) explained by respective coping model.

Model of Best Fit

With regard to the model of best fit, the composite strain model may be seen to provide the most parsimonious explanation for the variability in symptoms of strain reported by the sample. It accounts for a wider range of strain related symptoms and explains the highest percentage of the variance in strain. As the results show, although the physical and psychological strain models have fewer significant predictors of strain, the addition of neuroticism to the composite strain model adds useful information to the variance explained by the model. Therefore, this model may be seen as the model of best fit, that is, the model which provides the most parsimonious explanation for the symptoms of strain reported by the sample.

Moreover, across the solutions for each model, only the effect of beliefs social support and physical coping were common to each model. The effect of personal beliefs indicating the relative importance and significance of appraisal processes in the transactional process of stress; and the effect of physical coping (i.e., self-care), the effectiveness of this coping behaviour to reduce or counteract physical and psychological symptoms of strain.

However, in comparison to the significant effect of beliefs social support and neuroticism in the respective models, the relative effect of expectancies for psychological and physical strain do not add useful information to the explained variance. As a result, there is no support for the hypothesis (H1) that expectancies attributed to symptoms of

physical and psychological strain would contribute useful information to the explained variance in strain when placed in the presence of significant work role stressor, belief, coping and neuroticism predictors of strain.

Table 3.2.4.9
Backward Regression: Models of Best Fit - Physical, Psychological and Composite Strain on Work Role Stressor, Composite Expectancy, Belief , Coping and Neuroticism Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
	Neuroticism			0.3784	5.015	.0000
Physical Strain#	Recreational Coping	48.87%	47.26%	-0.2176	-2.850	.0051
	Social Support Demands#			0.1954	2.695	.0080
	Physical Coping			-0.1548	-2.108	.0370
Mult R=.6991; SE 0.8323; F(4,127) 30.3509, p. 0000						
	Rational/Cognit Coping			-0.4536	-6.601	.0000
Psych Strain#	Physical Coping	51.82%	50.30%	-0.2186	-3.251	.0015
	Role-Boundary			0.1981	3.166	.0019
	Social Support Demands#			0.2015	3.108	.0023
Mult R=.7198; SE 0.7717; F(4,127) 34.1429, p. 0000						
	Neuroticism			0.2697	3.742	.0003
	Rational/Cognit Coping			-0.2265	-3.290	.0013
Strain Comp#	Physical Coping	58.24%	56.59%	-0.2177	-3.207	.0017
	Social Support Demands#			0.1780	2.705	.0078
	Recreational Coping			-0.1887	-2.680	.0083
Mult R=.7632; 0.7333; F(5,126) 35.1503, p. 0000						

Note: Pout, ≥ .051; #Transformed Variable; Physical, Psychological and Composite Strain Scales - Transformed Scales

Further, when the relative utility of the strain scales is compared, the 25 item Composite Strain scale is clearly the more useful but not the most parsimonious measure of strain. It accounts for an additional 9.37% (9.33% adj) of the explained variance beyond the 48.87% (47.26% adj) explained by the Physical Strain scale; and 6.42% (6.29% adj) beyond the 51.82% (50.30% adj) explained by the Psychological Strain

scale. However, when seen in terms of parsimony, the ten item Psychological Strain scale, although restricted to the measurement of mood and adjustment symptoms of strain, is clearly the more efficient measure of strain. Each item in the scale accounts for 5.182% (5.03% adj) of the variance explained by the model. By comparison, those in the 20 item Physical Strain scale each account for a much lower 2.44% (2.36% adj) of the variance explained by the model; and those in the 25 item Composite Strain scale, a slightly lower 2.34% (2.26% adj) of the variance explained by the model (see also Appendix D.2, Table D.9) .

3.2.4.4.4.5 Hypothesis Testing

Hierarchical modelling was used to (a) confirm the theoretical importance of beliefs social support in the physical, psychological and composite strain models; and (b) test the hypothesis (H2) that the incremental effect of personal beliefs associated with the provision of social support would add significant information to the cumulative variance explained by the model when placed in the presence of significant work role stressor, expectancy, coping and neuroticism predictors of strain.

As the summary results for the physical strain (see Appendix D.1.2.3, Table D.7), psychological strain (see Appendix D.1.2.3, Table D.8) and composite strain (see Table 3.2.4.10) models indicate, for each solution the incremental effect of the Belief Social Support scale adds significant information to the explained variance in symptoms of strain. However, as these results further indicate, the incremental effect of beliefs social support in the respective models is weak. For example, as Table 3.2.4.10 shows, when placed in the presence of neuroticism and coping predictors of strain, the incremental effect of beliefs social support adds a low 2.43% (2.16% adj) to the 55.82% (54.43% adj) explained by the cumulative effect of dispositions for neuroticism and coping behaviours.

Table 3.2.4.10
Hierarchical Regression: Composite Strain on Neuroticism, Coping, and Belief Social Support Scales

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
	Step 1								
Disposition	Neuroticism	34.88%	34.38%	34.88%	.0000	.5906	0.107 - 0.173	8.344	.0000
Mult R=.5906; SE 0.9015; F(1,130) 69.6238, p. 0000									
	Step 2								
	Physical					-.2340	-0.071 - -0.019	-3.378	.0010
Coping	Rational Cognitive	55.82%	54.43%	20.94%	.0000	-.2312	-0.072 - -0.018	-3.279	.0013
	Recreational					-.1996	-0.060 - -0.010	-2.771	.0064
Mult R=.7471; SE 0.7513; F(4,127) 40.1134, p. 0000									
	Step 3								
Belief	Soc Supp Demands#	58.24%	56.59%	2.43%	.0078	.1780	0.081 - 0.521	2.705	.0078
Mult R=.7632; SE 0.7333; F(5,126) 35.1503, p. 0000									

Note: pout, ≥ .05; #Transformed Variable; Composite Strain Scale - Transformed Scale.

Therefore, given these results, the findings illustrate that the personal meaning assigned to the provision of social support (i.e., beliefs social support) contributes both unique and significant information to the explained variance in symptoms of strain. Furthermore, they illustrate the theoretical importance and functional involvement of personal beliefs (i.e., appraisal) in the prediction of physical, psychological and composite strain. As a result, there is support for the hypothesis (F2) that the incremental effect of beliefs associated with the provision of social support would contribute significant information to the explained variance in strain when placed in the presence of work role stressors, expectancies, coping and neuroticism.

3.2.4.4.5 Moderator Analyses

Using the nine significant predictors of strain identified in the baseline analyses (see Table 3.2.4.5 and footnote 6) as the basis to form moderator models, a series of moderator analyses were used to explore the nature and significance of moderating effects related to physical, psychological and composite symptoms of strain (Baron & Kenny, 1986; Cohen & Cohen, 1983; Stone & Hollenbeck, 1989). From these predictor variables, 31 moderator models and the corresponding interaction terms were formed for each measure of strain; overall, a total of 93 moderator models. Specifically, from the two predictor variables used in each model, each was assigned to either a moderator or main effect role. From the product of these terms, an interaction term was formed.[7]

Frequency plots and skew coefficients were used to evaluate the normality of the interaction terms. Where necessary, univariate outliers distant from the body of the distribution were recoded to values closer to the next most distant value as a means to improve the normality of the data distribution to values of skewness less than 1.0 (Tabachnick & Fidell, 1989, Tetrick & LaRocco, 1987). In addition, for skewness values greater than 1.0 and where the interaction term was formed from non-transformed scales, square root transformations were used to reduce the skewness of interaction terms to values less than 1.0 (Stone & Hollenbeck, 1989). Following the correction of the interaction terms to approximate normality, correlations between the interaction terms and dimensions of strain were used to eliminate non-significant interaction terms

[7] Note: Excludes a moderator model based on the interaction of Role-Boundary and Role-Overload work role stressors.

from the moderator analyses. That is, where the probability of the correlation between an interaction term and strain was > 0.05 (Two-Tailed), the interaction term was eliminated from the moderator analyses.

From these analyses, 25 of the correlations had probabilities > 0.05 and ranged between a minimum 0.053 (r = -0.17) to a maximum 0.94 (r = 0.01). By contrast, 68 of the correlations had probabilities ≤ 0.05. These ranged between a minimum 0.00 for the correlation between the interaction of Neuroticism*Role-Overload and the Composite Strain scale (i.e., r = 0.61) to maximum 0.047 for the correlation between the interaction of Rational/Cognitive Coping*Role-Boundary and the Composite Strain Scale (i.e., r = -0.17). Using this method, 68 moderator models were retained to explore the nature of moderator effects on symptoms of strain.

Following the screening and elimination of non-significant moderator terms from the moderator analyses, a series of regression analyses explored the data for evidence of multivariate outliers and where necessary, the case (s) was/were deleted from the data set for the respective moderator analysis (Tabachnick & Fidell, 1989). Using this method for each of the 31 moderator models using either the Physical, Psychological or Composite Strain scales as the DV, an average 2.1 multivariate outliers were identified for each of the models with a minimum of zero for three of the models; a maximum of five for one of the models; and a mode of one for nine of the models. Following the removal of multivariate outlier cases from the respective models, the data sets for the respective moderator analyses ranged from a minimum n = 127 to a maximum of n = 132. Further, the frequency plots for the 68 moderator terms were considered to reflect relatively normal distributions; skewness coefficients for the plots average a positive 0.56 and range from a minimum of 0.20 to a maximum of 0.89.

For each moderator analysis, the moderator variable was first entered into the model, next the main effect term and finally, the interaction term. Further, the significance of the change in F from the incremental effect of the moderator term in the model at a probability ≤ 0.05 and positive or negative T values > zero and probabilities ≤ 0.05 (Two Tailed) were used to interpret the significance of the interaction effect.

Table 3.2.4.11 shows the results for the significant moderator analyses. As evident from the data, for each segment of moderator analyses, having "partialled out" or controlled for the effect of the moderator and main effect variables, three of the moderator terms contribute unique and significant information to the cumulative variance explained by the model. Thus, from the 68 moderator analyses nine were found significant and exceeds that expected by chance at a conservative probability of 0.10; that is, from the 68 models, by chance alone 6.8 of the interaction terms would be expected to effect a significant effect on the cumulative variance (Boumans & Landeweerd, 1992).

As the results show, of the seven moderator variables used to form the 31 interaction terms in each segment of analyses, only rational/cognitive coping and neuroticism were found to reflect a significant interaction with the main effect. The moderating effect of rational/cognitive coping is evident in four of the models and the moderating effect of neuroticism, in five of the models. In particular, as evident for this sample, dispositions for neuroticism moderate the effect of the main effect on physical and composite symptoms of strain and the use of rational/cognitive coping, the effect of the main effect on psychological symptoms of strain. In other words, the data suggests that specific moderating factors tend to moderate physical and psychological symptoms of strain. Those for physical symptoms of strain moderated by personality dispositions; and those for psychological facets of strain, by a diversity of cognitive strategies.

Table 3.2.4.11
Hierarchical Regression: Moderator Analyses - Physical, Psychological and Composite Strain on Main Effect and Moderator Term

(1) Dependent Variable = Physical Strain#

Model	Variable Entry+	RSqr	RSqr (adJ)	RSqr Ch	Sig F Ch	B Final+	Beta Final+	T Final+	Sig T Final+
Rat Cognit Coping	RCC	18.55%	17.91%	18.55%	.0000	0.0936	0.4577	1.143	.2551
& Role-Overload#	RO	18.56%	17.27%	0.01%	.8978	0.8378	0.6685	2.159	.0328
n = 130	RC*RO	21.76%	19.90%	3.20%	.0248	-0.0469	-1.0110	-2.271	.0248
Neuroticism &	N	29.59%	29.03%	29.59%	.0000	0.3579	1.4721	3.831	.0002
Soc Supp Demands#	SSD	33.80%	32.74%	4.21%	.0056	1.4406	0.8470	3.844	.0006
n = 128	N*SSD	35.78%	36.07%	3.78%	.0070	-0.0960	-1.4317	-2.740	.0070
Neuroticism &	N	30.84%	30.29%	30.84%	.0000	-0.0627	-0.2546	-0.931	.3537
Rat Cognit Coping	RCC	34.40%	33.35%	3.56%	.0103	-0.1538	-0.7614	-3.550	.0005
n = 128	N*RCC	38.24%	36.74%	3.84%	.0063	0.0097	0.7478	2.777	.0063

(2) Dependent Variable = Psychological Strain#

Model	Variable Entry	RSqr	Rsqr (adJ)	RSqr Ch	Sig F Ch	B Final#	Beta Final#	T Final#	Sig T Final#
Rat Cognit Coping	RCC	37.57%	37.08%	37.57%	.0000	0.0537	0.2750	0.818	.4147
& Role-Overload#	RO	42.02%	41.11%	4.46%	.0022	1.0246	0.8573	3.298	.0013
n =130	RC*RO	44.88%	43.56%	2.85%	.0118	-0.0422	-0.9542	-2.554	.0118
Neuroticism &	N	21.06%	20.44%	21.06%	.0000	0.3789	1.5493	3.779	.0002
Soc Supp Demands#	SSD*	24.05%	22.84%	2.99%	.0284	1.5375	0.8986	3.525	.0006
n = 128	N*SSD	28.98%	27.76	4.93%	.0040	-0.1102	-1.6347	-2.933	.0040
Rat Cog Coping &	RCC	38.39%	37.91%	38.39%	.0000	-0.0069	-0.0338	-0.124	.9019
Expect Psyc Stress	EPS	40.16%	39.21%	1.76%	.0562	1.0062	0.7017	2.518	.0131
n = 129	RCC*EPS	42.19%	40.80%	2.03%	.0382	-0.0426	-0.7090	-2.313	.0382

(3) Dependent Variable = Composite Strain#

Model	Variable Entry	RSqr	RSqr (adJ)	RSqr Ch	Sig F Ch	B Final*	Beta Final*	T Final*	Sig T Final
Rat Cognit Coping	RCC	29.86%	29.31%	29.86%	.0000	0.0903	0.4557	1.252	.2132
& Role-Overload#	RO	31.42%	30.34%	1.57%	.0911	1.0575	0.8709	3.091	.0025
n = 130	RC*RO	35.26%	33.71%	3.83%	.0072	-0.0496	-1.1057	-2.731	.0072
Neuroticism &	N	30.11%	29.55%	30.11%	.0000	0.4041	1.6713	4.432	.0000
Soc Supp Demands#	SSD	34.54%	33.50%	4.44%	.0043	1.6435	0.9715	4.143	.0001
n = 128	N*SSD	39.91%	38.46%	5.37%	.0012	-0.1137	-1.7057	-3.328	.0012
Neuroticism &	N	30.09%	29.54%	30.09%	.0000	-0.0373	-0.1546	-0.592	.5549
Rat Cognit Coping	RCC	41.48%	40.54%	11.39%	.0000	-0.1569	-0.7931	-3.874	.0002
n = 128	N*RCC	43.73%	42.37%	2.25%	.0277	0.0073	0.5728	2.228	.0277

Note: (a) Variable Entry+ - Order of Entry Into Model; (b) Final+ - Values For B, Beta, T & Sig T in Final Equation; (c) The First Variable in Each Model is the Moderator Variable and the Second, the Main effect Variable; (d) # Transformed Variable; Physical, Psychological and Composite Strain Scales - Transformed Scales

Therefore, taken collectively, there is in effect only partial support for the hypothesis (H3) that expectancies for physical and psychological strain, beliefs associated with social support, coping behaviours and dispositions for neuroticism would moderate the relationship between predictors and symptoms of strain. As evident from the results, only rational/cognitive coping and neuroticism moderate the relationship with strain; expectancies, beliefs and the use of recreational, physical and social support coping do not.

3.2.4.4.5.1 Graphical Illustrations of Moderator Effects

Figures 3.2.4.1 to 3.2.4.4 illustrate the moderating effect from (a) the interaction between rational/cognitive coping and expectancies for psychological stress on the variance in psychological strain and (b) the interactions related to composite symptoms of strain. Further, with the exception of the interaction between the rational/cognitive and expectancy variables, the interactions related to physical and psychological symptoms of strain were assumed to replicate those related to composite symptoms of strain. Accordingly, the respective moderating effects are not included in the figures. In addition, because transformed scales are used in the moderator analyses, the figures may not reflect the actual magnitude and direction of the moderating effect. Therefore, to facilitate the explanation of the interactions, Figures 3.2.4.5 to 3.2.4.8 illustrate the moderating effect of the interactions based on data related to the original scales.

For moderator analyses based on continuous variables, a family of regression lines may be calculated for high, average and low values of the moderator term and plotted against the Y and X variables to illustrate the effect of the moderator term (Cohen & Cohen, 1983; Heinisch & Jex, 1997; Rhodes & Woods, 1995; Robertson et al., 1990).

As Cohen and Cohen note, to calculate a family of regression lines which reflect low (i.e., 1 SD below the mean), average and high (i.e., 1 SD above the mean) moderator values, the normal multiple regression equation may be expressed in the form:

$$Y = (B_2 + B_3X_1)X_2 + (B_1X_1 + A)$$

Where: $(B_2 + B_3X_1)X_2$ is the slope for the family of regression equations; $(B_1X_1 + A)$ the intercept for the lines; A the intercept from the regression solution; B_1 and B_2 the unstandardised regression coefficients for the variables X_1 (i.e., moderator) & X_2, (i.e., main effect); and B_3, the unstandardised regression coefficient for the X_1*X_2 interaction term (pp. 322-323).

Figures 3.2.4.1 and 3.2.4.5 illustrate the link between strain and role-overload stressors moderated by levels of rational/cognitive coping; Figures 3.2.4.2 and 3.2.4.6, the link between strain and general beliefs associated with social support demands when moderated by levels of neuroticism; Figures 3.2.4.3 and 3.2.4.7, the link between strain and the use of rational/cognitive coping moderated by dispositions for neuroticism; and Figures 3.2.4.4 and 3.2.4.8, the relationship between expectancies for psychological stress and symptoms of strain moderated by levels of rational/cognitive coping.

Taken together, the figures indicate that individual differences can be conceptualised and measured as either general personality dispositions (e.g., neuroticism) or as beliefs about stressors, about strain and about coping behaviours or in terms of use of coping behaviours/styles. As the figures show, individual differences in dispositions for neuroticism moderate (a) the link between strain and beliefs about social support demands and (b) the effect of rational/cognitive coping on strain; and individual differences in rational/cognitive coping, a moderating effect on (c) the relationship between role-over-

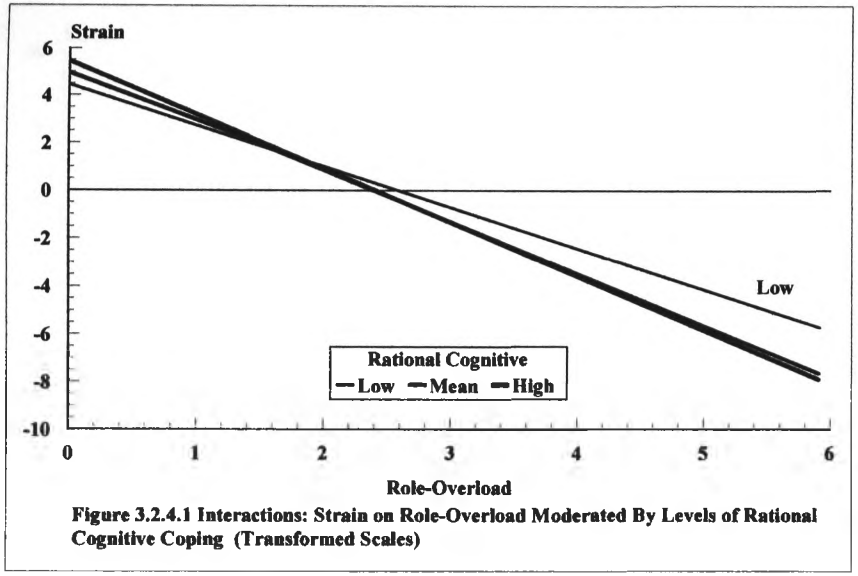


Figure 3.2.4.1 Interactions: Strain on Role-Overload Moderated By Levels of Rational Cognitive Coping (Transformed Scales)

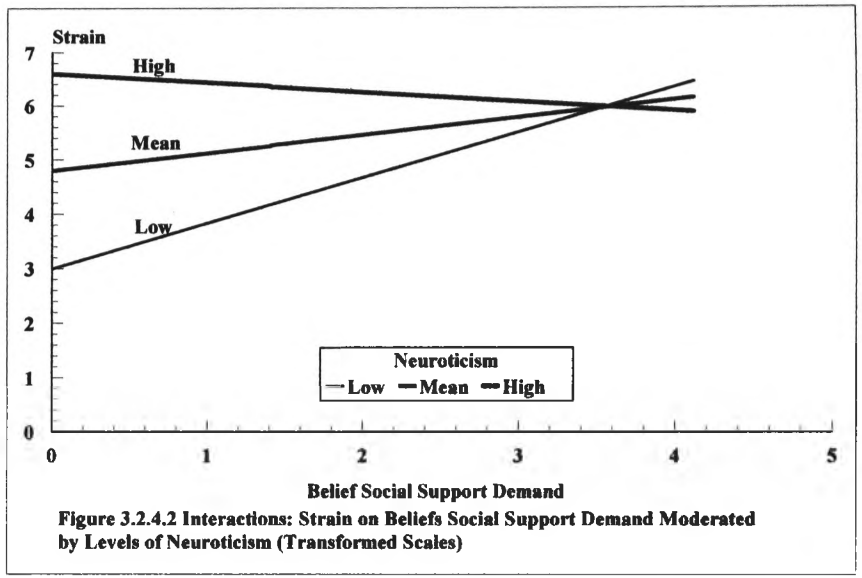


Figure 3.2.4.2 Interactions: Strain on Beliefs Social Support Demand Moderated by Levels of Neuroticism (Transformed Scales)

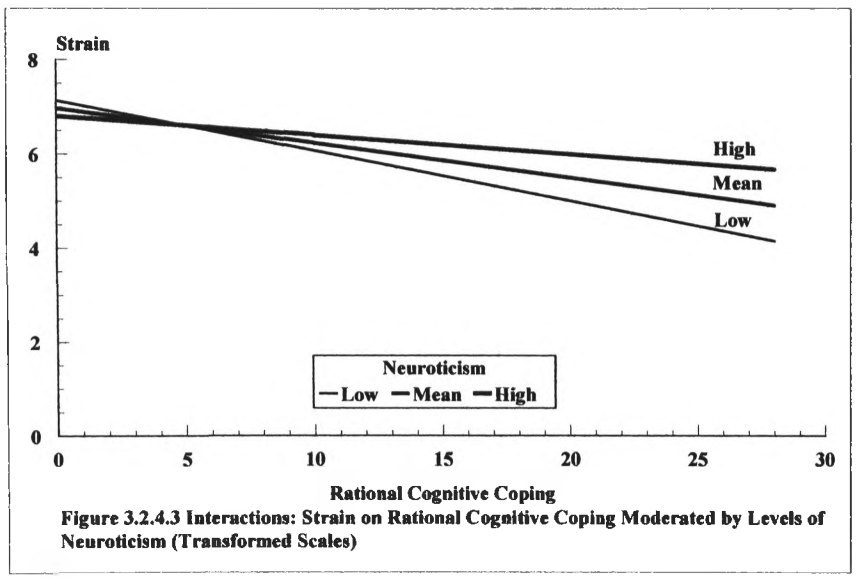


Figure 3.2.4.3 Interactions: Strain on Rational Cognitive Coping Moderated by Levels of Neuroticism (Transformed Scales)

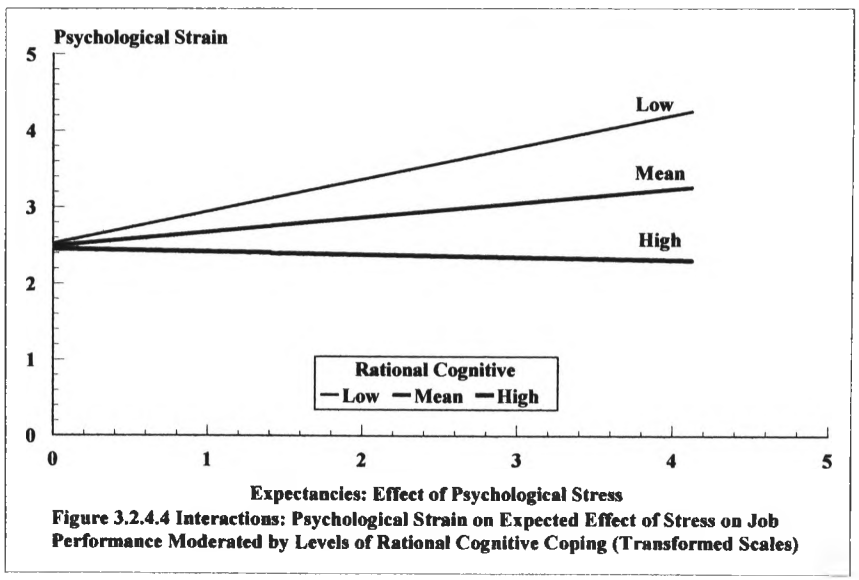


Figure 3.2.4.4 Interactions: Psychological Strain on Expected Effect of Stress on Job Performance Moderated by Levels of Rational Cognitive Coping (Transformed Scales)

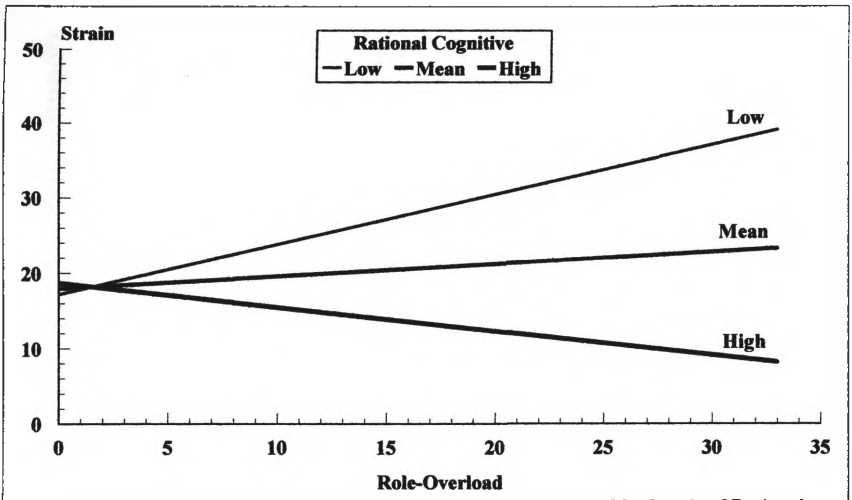


Figure 3.2.4.5 Interactions: Strain on Role-Overload Moderated by Levels of Rational Cognitive Coping (Original Scales)

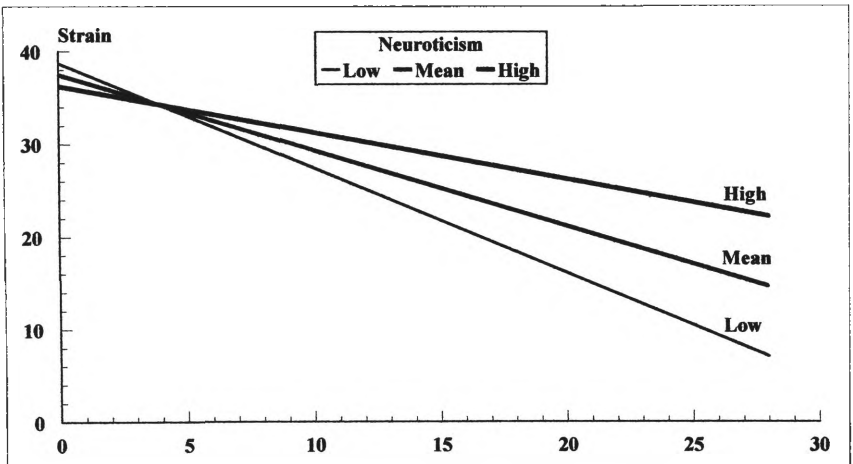


Figure 3.2.4.7 Interactions: Strain on Rational Cognitive Coping Moderated by Levels of Neuroticism (Original Scales)

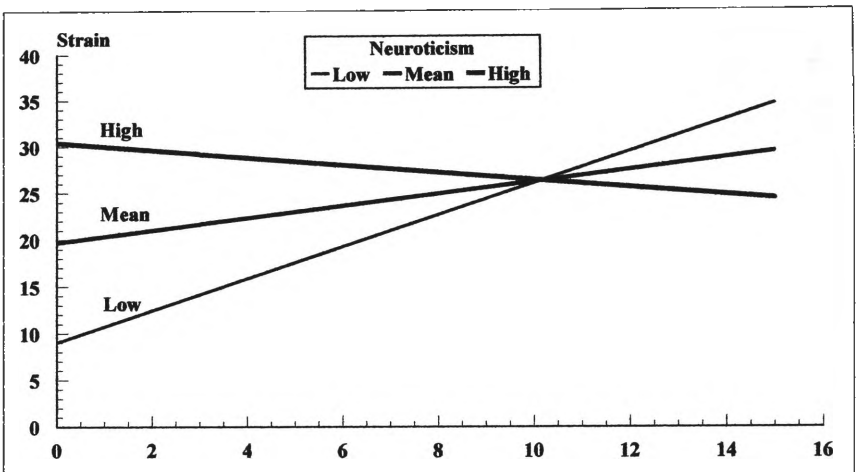


Figure 3.2.4.6 Interactions: Strain on Beliefs Social Support Demands Moderated by Levels of Neuroticism (Original Scales)

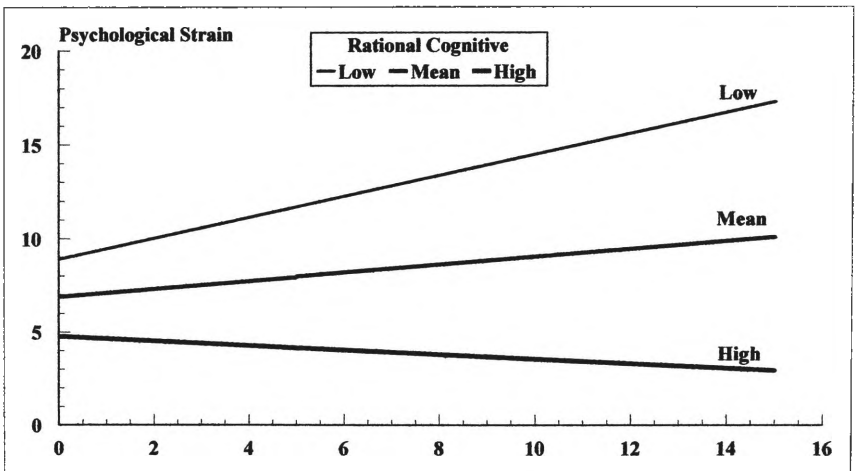


Figure 3.2.4.8 Interactions: Psychological Strain on Expected Effect of Psychological Stress Moderated by Levels of Rational Cognitive Coping (Original Scales)

load stressors and strain and (d) the link between expectancies attributed to psychological stress and symptoms of psychological strain. Further, as indicated by the graphs, the effect of individual differences reflects in different strain related outcomes; the effect of a moderator may relate to an increase or decrease in symptoms of strain.

3.2.4.5 Discussion

The results demonstrate that both the measurement of the transactional process underlying stress and the explanation of the variance in strain can be significantly improved by including measures of personal meaning (i.e., expectancy, belief, dispositions for neuroticism and rational/cognitive coping appraisal processes) in the measurement model.

First, the results demonstrate that the personal meaning assigned to both intrinsic and extrinsic sources of personal demand is an important facet of cognitive processing that underlies the explanation of stress and strain related outcomes. As analyses show, both expectancies related to the effect of psychological strain on work performance (i.e, intrinsic reference) and general beliefs associated with the provision of social support (i.e., extrinsic reference) contribute useful information to the explained variance in symptoms of strain.

Second, the results show that there are several ways to conceptualise and measure the nature of personal meaning (e.g., general beliefs, expectancies, neuroticism & rational/ cognitive coping); each of which contribute significant information to the explained variance in symptoms of strain.

Third, and perhaps the most important for the argument underlying this thesis, the findings from moderator analyses demonstrate that variations in the nature of individual

differences related to dispositions for neuroticism (i.e., self-evaluations) and coping (i.e., rational/cognitive strategies) appraisals are reflected in different strain related outcomes.

However, although the moderator analyses have statistical importance and interesting in their own right, the conceptual significance of moderator analyses may be seen to have limited value. The interpretation of moderator terms (i.e., multiplicative variables) and significant moderator analyses is difficult if not impossible and at best only provide a somewhat limited insight to the role of individual differences in strain related outcomes (Harris, 1995). Therefore, even though moderator analyses may demonstrate a significant relationship between individual differences and strain, the moderator term does not reflect a construct which is both meaningful and interpretable. As a result, there is in effect no conceptual basis by which to interpret and understand the nature and role of individual differences in the stressor to strain process.

Measurement of Personal Meaning

Using a nomothetic approach to self-report measurement, the findings of the study show that variations in the nature and role of personal meaning contribute significant information to the explained variance in symptoms of strain. Specifically, the study has shown that personal meaning in terms of expectancies for psychological stress, personal beliefs related to social support demands, dispositions for neuroticism and rational/cognitive coping strategies (i.e., secondary appraisals) have both direct and moderating effects on symptoms of strain. Further, when the results are related to the role of appraisal in the transactional process, they serve to demonstrate the significance and important role of both specific and more general appraisal processes in the stressor to strain process.

One important finding from the study was that the more general appraisal processes (i.e., neuroticism & rational/cognitive coping) explain the greater percentage of the variance in strain. As the results for the models of best fit indicate, the relative effects of neuroticism (i.e., self-evaluations) and rational/cognitive coping (i.e., secondary appraisals) were the dominant predictors of strain across the models. Therefore, this would seem to suggest that a more broad approach to the measurement of the personal meaning attributed to common work stressors may well account for more of the variance in symptoms of strain. As the correlational and graphical data from studies one and two suggest, there is seemingly a cognitive fusion or functional linkage between expectancy and valence appraisal processes which subsequently reflects as a more holistic (i.e., more general) evaluative cognitive process. This suggests that people may initially avoid the use of more specific appraisal processes, but rather first may appraise the nature of objects and events in terms of their personal desirability and then if necessary, shift the focus of information processing to the more specific appraisal processes. That is, the appraisal process may initially place the emphasis on the degree of imbalance between the environment and the personal motives (e.g. career progress, responsibility) and the expected ideals for work conditions (e.g., autonomy, safety) desired by the individual (Lazarus et al., 1952; Locke, 1969; Peacock & Wong, 1990).

The results related to measures of expectancy in the models of best fit and those for general beliefs in the hierarchical models, however, are by and large poor. The effect of expectancies was not significant in the models of best fit and the incremental effect of personal beliefs in the hierarchical models, on average only explained a low 2.7% (adj) of the cumulative variance.

With respect to the data for the Composite Expectancy scale, the variability of the responses to the expectancy scales is normally distributed, the SD for the scale approximates the expected value and the reliability of the scale is moderate. Therefore, this would seem to rule out deficiencies in the data as the cause of the non-significant effect in the models of best fit. However, when seen in terms of conceptual overlap, the correlations indicate that the relation between expectancies for strain and variables in the best fit models is relatively high. In particular, the expectancy scale correlates -0.27** with rational/cognitive coping, a similar 0.26** with social support demands and a higher 0.37** with neuroticism. As a result, having "partialled out" the variance common to the respective scales, the unique effect of expectancies in the models of best fit is not significant. Seemingly, there is a conceptual similarity or overlap between measures of expectancy and neuroticism. Furthermore, the data indicates that the importance of expectany appraisals in the stressor to strain process is in effect moderated or nullified by dispositions for neuroticism.

The data for the personal beliefs scale, however, would seem to suggest that the correlations with strain and their unique effect in both the models of best fit and hierarchical models is likely less than the true values. The reliability (i.e., internal consistency of the items in the scale) is rather low (i.e., $\alpha = 0.5510$) and indicates that errors in measurement account for 45% of the variability in the response to the scale items (Spector, 1994). Thus, it is likely that the correlations with strain are somewhat below the value for reliable data (Tabachnick & Fidell, 1989). Furthermore, and perhaps the more important, the belief scale correlates strongly with neuroticism (i.e., -0.45**) and suggests that (a) there is a conceptual overlap between the scales and (b) the appraisal of social support demands is likely influenced when by dispositions for neuroticism. As a result,

in hierarchical analyses, due the extent of the common variance explained by the correlation (i.e., R^2 = 20.25%), the unique or incremental effect of the moderator term is, it would seem, substantially reduced.

Thus, given these results and the consistency of those from studies one to three, it is feasible to conclude that other than theoretical and heuristic value for research, personal meaning in terms of expectancy has, it would seem, little practical value as a medium by which to substantially improve the measurement and explanation of strain.

Appraisals of expectancy may, however, have utility where there is a need to verify the construct validity of a related construct. As the results show, the moderate correlation between expectancies for psychological stress and neuroticism (i.e., r = 0.36**) suggests that these scales tend to measure similar aspects of self-evaluations. In addition, due to their conceptual similarity with the hardiness construct, it is likely that measures of expectancy and neuroticism are strongly related to dispositions for hardiness (Cox & Ferguson, 1991). Therefore, in future research, it would seem worthwhile to utilise the expectancy scale as a standard for self-evaluations or basis by which to assess the construct validity of scales used to measure dimensions of personal hardiness.

Further, even though personal beliefs related to the provision of social only explained a very small percentage of the variance in strain, they did nonetheless contribute significant information to the explained variance in strain for the models of best fit. Therefore, the relative power of beliefs may be seen as in effect highly significant both in terms of (a) their effect in the model and (b) the insight to the personal meaning attributed to social relationships. In addition, this result demonstrates that the reciprocal effect of the home-work interface has a significant effect on symptoms of strain. Thus, on the basis of this result, it would seem worthwhile to further explore the effect of beliefs concerned with social support in either a work or social context.

Equally important, and contrary to the results of published research (e.g., Osipow & Davis, 1988; Osipow et al., 1985) and those for studies one to three, the present study has shown that improvements in the measurement and explanation of the stressor to strain process is not necessarily centred or dependent on the relative effect of common work stressors (i.e., the recognition of stressors). As the data for the model of best fit shows, common work stressors were not significant in the model; the relative effect of belief, coping and personality variables, however, explained a very high 58.24% (56.59% adj) of the variability in a composite measure of strain.

The reason for the low correlations with strain and the non-significant relative effect of common work stressors in the model is difficult to pinpoint. The observed range of responses to the stressor scales reflect the range of the scale, the response distributions are normally distributed and the SD's for the scales approximate those expected from the observed range of responses (see Appendix D.1.1.2, Table D.3). However, the reliability (i.e., internal consistency of the items in each scale) for the boundary (i.e., α = 0.6060) and insufficiency (i.e., α = 0.6260) scales is at best moderate and may account for the low correlations with strain. Therefore, it may be the case that random errors in measurement account the non-significant effect of common work stressors in the model of best fit (Spector, 1994; Spector & Brannick; 1995). As the alpha coefficients indicate, errors in measurement account for 40.0% and 38.0% of the variability in the responses to the respective scales. Thus, as opposed to non-random bias in the response to scale items, the alpha coefficients indicate that the participants response to the items is not consistent and implies that they have not given a valid response to the items in the scales. As a result, the correlations between the boundary and insufficiency scales with strain are likely somewhat less than the true value.

Moderator Analyses

Perhaps the most important result from the study was the finding that individual differences related to rational/cognitive coping strategies and dispositions for neuroticism were found to moderate relationships with strain. As the graphical data demonstrates, the moderating effect of individual differences is reflected in different strain related outcomes. Furthermore, the moderator analyses were found to expose subtleties in the moderating role of appraisal processes which would otherwise remain undetected by main effect analyses.

Although in general small, the moderating effects from the significant interactions between rational/cognitive coping and (a) role-overload stressors (i.e., R^2 = 3.37 adj) and (b) expectancies related to psychological Stress (i.e., R^2 = 1.59% adj); and those between neuroticism and (a) beliefs about social support (i.e, R^2 = 4.96% adj) and (b) rational/cognitive coping (i.e., R^2 = 1.83% adj) do nonetheless provide some important insight to the nature and role of individual differences in the relationship between stressors and strain.

As the graphs for the significant interactions illustrate (see Figures 3.2.4.5 - 3.2.4.8), the presentation of moderator effects in graphical form enables an improved understanding or insight to (a) how people cope with stress; and (b) the complex interaction of primary appraisal (i.e., what is it) and secondary appraisal (i.e., what can I do about it) processes in the stress process (Anshel, et al., 1997; Lazarus & Folkman, 1984). Furthermore, and perhaps the most important observation from the figures, they show that variations in the nature of individual differences are related to significant changes in symptoms of strain.

In addition, the results give some insight to the functional role of appraisal processes in the transactional process underlying stress and strain. Specifically, they have shown that individual differences in personality dispositions (i.e., neuroticism) may also act to moderate (a) personal beliefs associated with the provision of social support and (b) appraisal based coping variables (i.e., appraisals for rational/cognitive coping). Furthermore, in addition to the main effect of coping on strain, they show that individual differences underlying methods of coping (i.e., rational/cognive coping) may function as moderators of the stressor to strain process. As Cox and Ferguson (1991) have argued, in addition to its direct effect on symptoms of strain, the coping variable itself (e.g., rational/cognitive coping) may also act to moderate the relationship between stressors and strain.

Furthermore, the moderator analyses have shown that (a) interscale correlations related to the interaction terms and (b) correlations between moderator terms and strain, may at times be misleading. As indicated by the regression lines, inverse moderating relationships cannot be detected by general correlations; it is the graphical representation of the significant moderator effects that exposes the nature and role of individual differences underlying correlational data. For instance, the 0.59** correlation between neuroticism/belief moderator term and strain (see Table 3.2.4.12 below) suggests a positive or increasing relationship between the moderator term and strain. However, as Figure 3.2.4.6 indicates, for low neuroticism the relationship with strain in positive and for high neuroticism, there is an inverse relationship with symptoms of strain.

Conceptual Limitations of Moderator Analyses

Although significant, the additional variance explained by the moderator terms is, on average, quite small. Furthermore, the result is only achieved from (a) an inordinate number of analyses which border on chance (i.e., nine significant from 93 moderator

terms) and (b) the use of a complex mathematical procedure to graph the relationship between individual differences and strain. Therefore, although significant moderator analyses are instructive (and enticing) in their own right, the effort required to identify a small gain in the explained variance would perhaps seem to outweigh the benefits of moderator analyses. Furthermore, due to the increased possibility of Type 1 errors from multiple analyses, there is the chance that significant results may in effect be invalid and therefore an artefact of the analyses (see Stone & Hollenbeck, 1989 for a discussion of controversial issues related to moderator analyses).

However, the more problematic, is the issue of conceptual significance of significant moderator analyses. The issue begs the following questions: is the moderator term a valid representation of the mental algorithm that combines the interaction of cognitive processes; is the moderator construct meaningful in its own right; does the construct have a conceptual basis; and can the results of moderator analyses be interpreted within the bounds of theory? For instance, within the bounds of transactional theory, it is only possible to conclude that (a) a relationship exists between variables and (b) variations in individual differences are reflected in symptoms of strain. Effects in the model reflect both reciprocal and dynamic processes and thus to imply cause and effect relationships denies the notion that feedback within the model is both a functional and integral facet of the resultant output from the model (Dewey & Bentley, 1949; Harris, 1995; Pervin, 1968).

Hence, it follows that moderator analyses based on the use of multiplicative terms give no clearly interpretable result. What is needed, are transactional constructs or individual difference variables (e.g., expectancies, neuroticism) which are both meaning-

ful and have a conceptual basis; variables which (a) discriminate the relationship between predictor and criterion variables without the need to form higher order multiplicative constructs or (b) eliminate the need to form indices of fit from P and E variables.

The conceptual limitations of moderator analyses further reflect in the correspondence between interscale correlations and moderator correlations with strain. Interscale correlations between individual difference (i.e., personal meaning) variables and the correlations between the associated moderator terms and strain are shown in Table 3.2.4.12 below. As the table indicates, correlations between dimensions of personal meaning are all significant and range from a low 0.29** to a moderate 0.47**. That is, they indicate that the more general appraisals of rational/cognitive coping and neuroticism correlate with the more specific belief and expectancy appraisals of personal meaning. Further, they suggest that the interaction between more general and the more specific dimensions of personal meaning have the potential to moderate the relationship with symptoms of strain. The correlations between the associated moderator terms and strain, however, are inconsistent and range from a not significant -0.11 to a maximum of 0.59**. Further, they indicate that the variance explained by the significant terms may range from a low of 4.41% to a maximum of 34.81%.

In addition, the table shows that the correlations between the more general rational/cognitive coping and neuroticism measures of personal meaning and significant work role stressors are noticeably lower than those between the measures of personal meaning and range to a maximum of 0.18* in magnitude. Therefore, on the strength of these correlations, moderator terms formed from the interaction between the recognition of stressors and the personal meaning of stressors are unlikely to moderate the relationship with strain.

However, in contrast to the interscale correlations, the correlations between the stressor moderator terms and strain are generally higher than expected and range from a low 0.17* to a high 0.61**. In addition, they indicate that (a) interscale correlations do not necessarily provide an insight to the relationship between moderator terms and strain; and (b) the terms have the potential to explain between 2.9% and 37.21% of the variance in symptoms of strain.

Table 3.2.4.12
Moderator Term Correlations: Interscale and Moderator Term With Strain

Interscale Correlations			r	Moderator Term	Strain r	Strain R^2
Personal Meaning						
Expectancies	-	Beliefs	0.29**	Expt*Belief	0.45**	20.25%
Expectancies	-	Rat/Cognit	-0.30**	Expt*Rat/Cog	-0.27**	7.30%#
Expectancies	-	Neuroticism	0.36**	Expt*Neur	0.52**	27.04%
Beliefs	-	Rat/Cognit	-0.27**	Belief*Rat/Cog	0.11	1.21%
Beliefs	-	Neuroticism	0.47**	Belief*Neur	0.59**	34.81%#
Rat/Cognit	-	Neuroticism	-0.46**	Rat/Cog*Neur	0.21*	4.41%#
Stressors						
Rat/Cognit	-	R-Boundary	-0.18*	Rat/Cog*RB	-0.17*	2.90%
Neuroticism	-	R-Boundary	0.18*	Neur*RB	0.51**	26.01%
Rat/Cognit	-	R-O'Load	-0.17*	Rat/Cog*RO	-0.34**	11.56%#
Neuroticism	-	R-O'Load	0.06	Neur*RO	0.61**	37.21%

n = 132; *p ≤ 0.05, **p ≤ 0.01; # Significant Moderator.

Taken together, the correspondence between interaction correlations and the correlation between moderator terms and strain are inconsistent. Further, the magnitude of moderator correlations with strain is, it would seem, no guide to the significance of moderator terms. As the table shows, moderator terms with high correlations do not necessarily moderate strain; conversely, those with low correlations may moderate relationships with strain.

In sum, it is difficult to make any sense of what the moderator terms actually mean and why some do or do not function as significant moderators of strain. Obviously, the relative independence of moderator terms and suppressor effects in the model determines their statistical significance in the model (Brown et al., 1993; Cohen & Cohen, 1975, 1983); when seen in terms of conceptual significance, however, the role of significant moderator terms in the model is essentially meaningless. Thus, whilst moderator analyses may highlight some interesting relationships and possibilities for research, they are not interpretable. What is needed, is measures of individual differences which obviate the need to form measures which reflect indices of P-E fit or multiplicative moderator terms; that is, the derivation of mathematical indices or terms which are presumed to represent the interaction of cognitive processes.

Thus, although the study shows the statistical significance of individual differences in the stressor to strain process, the result is conceptually not significant. Moderator analyses may be a route to follow, but their contribution to the understanding of the stressor to strain process is seemingly limited (Harris, 1995). There is a need to use constructs which have the ability to discriminate individual differences and a conceptual basis by which to interpret the role of individual differences in the stressor to strain process.

Summary of Discussion

Overall, the results of the study illustrate the importance of integrating the personal meaning assigned to intrinsic and extrinsic demands, personality dispositions and cognitive coping strategies into the self-report measurement and explanation of the transactional process underlying stressor to strain outcomes. Equally important, they illustrate that the magnitude of coping strategies (i.e., their use in terms of frequency) does not necessarily determine the personal significance of the coping strategy (Newton,

1989; Payne et al., 1988). Furthermore, when seen in transactional terms, they illustrate the important role of both specific and more general appraisal processes in the mental summation of the imbalance (i.e., stress) between actual (i.e., the recognition of stressors) and ideal demands (i.e., the moderating role of personal meaning) in the translation of stress to symptoms of strain. In addition, moderator analyses demonstrate that variations in individual differences are reflected in the stressor to strain process. However, although the moderator analyses are statistically significant, the conceptual significance of the moderator analyses is not significant. Thus, although interesting and suggesting a route for stress research to follow, it was concluded that moderator analyses per se do not significantly improve the understanding of the stressor to strain process.

Further, and perhaps the more important for the direction of future research, the results show that in comparison to the more specific appraisal processes, the more general measures of appraisal account for the greater percentage of the variance in strain. As a result, it would seem that a more general approach to the measurement of the personal meaning assigned to common stressors would likely explain an increased percentage of the variance in symptoms of strain. For instance, the personal desirability assigned to common work stressors may be seen as a more general appraisal process and therefore likely to account for a significant percentage of the variance in symptoms of strain. The tripolar response format "Would Like More" "About Right For Me" and "Would Like Less" provides a basis by which to evaluate the personal desirability of common work stressors. Further, there is the inference that these response anchors will discriminate individual differences in the personal desirability of common stressors.

Section Three

The Personal Evaluation of Common Work Stressors: An Imbalance Approach to the Self-Report Measurement of the Personal Desirability Assigned to Common Work Stressors

3.3.1 Introduction to Evaluative Research

Based on a nomothetic approach to measurement, the results from studies one to four have shown that measures of the personal meaning assigned to sources of demand in terms of (a) expectancy, (b) valence, and (c) personal beliefs are only able account for small percentage of the explained variance in symptoms of strain. Across the respective studies, the relative effect of expectancies explained on average a rather low 4.17% (adj) of the variance in symptoms of strain; and the relative effect of personal beliefs (see study four), a much lower 2.16% (adj) of the explained variance. The relative effect of the personal valence assigned to common work stressors, however, was by and large not significant in each study. Thus, from these results, there is empirical support for the hypothesis that the personal meaning assigned to work related demands in terms of expectancy and valence would significantly improve the measurement and explanation of occupational stress; however, the extent of the gain is very limited.

Furthermore, when seen in transactional terms, the results from previous studies provide little instructive insight to the role of appraisal processes in the mental summation of the imbalance between actual (i.e., the recognition of demands) and ideal (i.e., the personal meaning of demands) work related demands (Cummings & Cooper, 1979; Locke, 1969). As the results show, with the exception of the results from study four, the individuals recognition of common work stressors accounts for the highest percent-

age of the variance explained by the respective models. Therefore, these results suggest that the objective nature of work demands (i.e., their recognition in terms of frequency, intensity or duration) has the more important or dominant role in the mental algorithm that determines the cognitive imbalance (i.e., stress) between actual and ideal work demands.

However, it may also be the case that the recognition (i.e., description) of work demands is, to some extent, tainted or distorted by the personal meaning assigned to the demand (Caplan, 1983; Glowinkowski & Cooper, 1985). Due to the complex interaction of recognition and appraisal cognitive processes in the processing of cognitive information (James & James, 1989; James & Jones, 1980; Locke, 1969, 1984; Rand, 1964), it is possible that the person's recognition of demands is confounded to some extent by the reciprocal effect (see Chapter 2.3.6 & Figure 2.3.3) of the personal meaning assigned to the nature of the perceived demand (Kulik et al., 1987; Lazarus & Folkman, 1984). As a result, the underlying influence of personal meaning dimensions of appraisal in the recognition of stressors, may in effect account for the tendency of common work stressor scales to account for a high, if not inflated, percentage of the explained variance in strain.

The results from study four, however, tend to shed new light on the confounding effects of personal meaning on the nature of descriptive information. Neuroticism (i.e., self-evaluations) and rational/cognitive coping (i.e., secondary appraisals) were the dominant predictors of strain in the models of best fit from the variables used in the measurement model. This suggests that the more broad dimensions of appraisal may in effect subsume the role of the more specific appraisal dimensions (i.e., expectancy and valence) in the mental summation of the cognitive imbalance between actual and ideal demands. For instance, the appraisal of work demands in terms of their personal desir-

ability suggests that this domain or spectrum of the appraisal reflects (a) the person's like or dislike for the nature of the demand, (b) beliefs about the anticipated effect of the demand on their well-being, motives and/or personal needs and (c) personal values concerning the importance and valence of the demand and (d) individual differences in the nature of personality cognitive styles (see Chapters 2.1.2, 2.3.6 & Figure 2.1.1a).

Although the results from studies one to four indicate that measures of expectancy and valence may have little practical value, they did, however, suggest that the appraisal of demands in terms of expectancy and valence may in effect merge to form a more holistic and higher order dimension of appraisal. In short, the data suggests the existence of an appraisal process which seems to endow the individual with a more broad and economical method of cognitive processing (James, 1890; Payne, 1978). One which enables the individual to evaluate the nature of intrinsic and extrinsic demands in terms of preference or personal desirability; their desire for "Like More" or "Like Less" of the appraised demand (Arnold, 1967; Arnold & Glasson, 1968; Caplan et al., 1975; Cummings & Cooper, 1979; Kaplan, 1983; Lalljee et al., 1984; McMichael, 1978; Rand, 1966; Schabracq & Cooper, 1998). In other words, it reflects the individual's use of an appraisal (i.e., evaluative) process which relates more closely to their underlying motives (i.e., needs, values, aspirations, expectations and satisfaction with work) when faced with sources of stress (Anshel et al., 1997; Caplan et al., 1975; Cummings & Cooper, 1979; Edwards, 1988; French & Kahn, 1962; Kaplan, 1983; Lazarus, 1966, 1982, 1995; Lazarus & Folkman, 1987; Lazarus et al., 1952; Locke, 1969; Peacock & Wong, 1990; Rand, 1964, 1966; Singh & Baumgartel, 1965; Vogel et al., 1959; Zajonc, 1980).

Therefore, in view of the above theoretical reasoning and the results from previous studies, this sequence of evaluative studies sought to explore the measurement and relative effect of the personal meaning (Benner, 1984; Cohen, 1986; Fineman & Payne, 1981; Lazarus, 1995; McMichael, 1978; Monroe & Kelley, 1995; Osgood et al., 1957; Payne et al., 1988) assigned to common work stressors in terms of their personal desirability (Caplan et al., 1975; Dooley et al., 1987; Edwards, 1988, 1992; James & James, 1989; Kaplan, 1983; Locke, 1969; Sarason & Johnson, 1979; Sarason, Johnson, & Siegal, 1978; Schuler, 1980; Sutherland & Cooper, 1988; Van Harrison, 1978; Vinokur & Selzer, 1975) on symptoms of strain.

3.3.1.1 Theoretical Assumptions Underling the Self-Report Measurement of Personal Desirability

In philosophical terms, the concept of desirability can be seen to have its roots in Rand's (1964) thesis on the function of ethics (i.e., role of morality) in the thoughts and action of individual's. Morality reflects the individual's use of an acquired . . ."code of values to guide (their rational) choices and actions—(those) that determine the purpose and the course of their lives" (p.13). That is, in more concrete terms: "A value is what a person consciously or subconsciously desires, wants, or seeks to attain" (Locke, 1976, p. 1304). Accordingly, when seen in terms of action and virtue, an acquired or desired value may be seen as a source or the basis of motivation; they embody, as Rand argues . . . "that which one acts to gain and/or keep"; and the act of virtue, the means . . . "by which one gains and/or keeps it" (p.25). As such, the cardinal values of "reason" "purpose" and "self-esteem" and the corresponding virtues, "rationality" "productiveness" and "pride" are seen as those which in essence underpin the purpose and direction of human endeavour (p.25). As Rand (1964) argues:

> Man has no choice about his capacity to feel that something is good for him (her) or evil, but what (s)he will consider good or evil, what will give him (her) joy or pain, what (s)he will love or hate, desire or fear, depends on his (her) standard of value (p.28).

Consciousness and the individual's capacity for rational thought (reason), therefore, may be seen as the basis for knowledge, the judgement of values and the regulation of intentional behaviours (Rand, 1964, 1966). As Locke (1969) points out, a person's consciousness has . . . "three basic biological functions: (a) cognition (i.e., the identification of objects and events), (b) evaluation, (i.e., the appraisal of benefit or harm from perceived objects or events) and (c) the regulation of action" (p. 314). In short, the role of cognition (i.e., sensation, perception and conception) enables the person to recognise and conceptualise objects and events; evaluation (i.e., appraisal), in contrast, enables the person to confront existent objects and events by using their "code of values" as the standard (i.e., frame of reference) by which to enact some form of regulatory (i.e., cognitive or behavioural) action.

Therefore, given these three fundamental aspects of cognition, the individual's appraisal of an object or event (e.g., in terms of desirability or satisfaction) can be seen to reflect three interlinked elements of cognition. First, there is the perception of some existent; second, a value standard from which to make a value judgement; and third, there is a conscious assessment or cognitive evaluation of the discrepancy (congruence) between perception and a related value (Bandura, 1986; Locke, 1969). Furthermore, as Locke points out, value appraisals (i.e., those involving benefit or threat) and the intensity of the associated emotion should not be seen as a constant or innate psychological preconceptions of reality, but rather as an evaluative process that involves the relationship between the person's acquired value standard, a particular situation and the relative importance of the value standard involved in the appraisal process (see also Bandura, 1986; Locke, 1984). As Locke argues:

> Desires and satisfactions are not psychological primaries. They result from estimating the relationship between some perceived object or outcome and one's value standards. The causal concepts are perception, value and value judgment; the resultants are emotions such as desires, satisfaction, attraction, etc" (p. 322).

When related to the empirical domain, the concepts of desirability (i.e., appraisal) and discrepancy (i.e., imbalance between actual and ideal) are often used as the foundation or conceptual basis for theoretical models of both job satisfaction (dissatisfaction) and stress (Caplan et al., 1975; Cooper et al.,1988; Edwards, 1988; Kaplan, 1983; Locke, 1969,1976,1984; Marshall & Cooper, 1979, 1981; Payne et al, 1988; Shirom, 1982). The theoretical and empirical domain of these constructs, therefore, may in effect be seen as somewhat synonymous or overlapping in nature (Edwards, 1992). As Edwards notes, the definition of stress in terms of "desired states" . . . "is conceptually similar to most definitions of job satisfaction (e.g., Locke, 1976, 1984)"; that is, in more general terms, those which define the relationship between the appraisal of job characteristics and the values of the individual (p.247). The crucial distinction or distinguishing feature is, it would seem, their correspondence and operationalisation with criterion variables; specifically, their essential focus within the spectrum of well-being, motivation and behaviour. That for job satisfaction (i.e. positive appraisals) tending to emphasise the prediction of performance (i.e., motivation) or negative behavioural (i.e., withdrawal behaviours) outcomes (Cummings & Cooper, 1979; Locke, 1984; Smith, et al., 1969); and that for the domain of occupational stress, the relationship between facets of work (i.e., negative appraisals) and types of strain (i.e., psychological, social and physiological) related outcomes (Locke, 1984; Payne et al., 1988).

Locke (1984), for example, defines job satisfaction as . . . "a positive emotional response to the job resulting from an appraisal of the job as fulfilling or allowing the fulfilment of the individual's job values" (p. 103). Similarly, Smith et al. (1969), define job satisfaction as . . . "feelings or affective responses to facets of the situation" (p.6). That is, it is seen as a reflection of the difference between the desires (i.e., motives) of the individual and their experiences in a given situation. In other words, in this definition, job satisfaction is seen as an affective outcome which is related to (a) the goals (i.e. values) of the individual and (b) their efforts (i.e., forms of goal directed or avoidance behaviours) to achieve those goals.

The results, from research have shown a strong relationship between the individual's value standards (i.e., desires) and personal satisfaction (Locke, 1969). Locke, in a series of laboratory studies (1965, 1967,1968, 1969, 1976) found that the individual's degree of liking for a task was significantly related to their success on a task (i.e., a reflection of their desire to succeed on the task) and their personal satisfaction with a task. Furthermore, (Locke, 1969, 1976, 1984) found that a significant relationship exists between the desirability of job characteristics (i.e., their value importance in terms of "I should" or "I should not" have) and job satisfaction (dissatisfaction). Specifically, the presence of desirable job characteristics was found to correlate with job satisfaction (i.e., 0.65) and the presence of undesirable job characteristics, a significant relationship with job dissatis-faction (i.e., -0.39). As a result, there is store of empirical evidence which supports the view that distinctions in the nature of the desirability (i.e., personal meaning) assigned to characteristics of work is related to variations in the nature of the personal reactions (i.e., satisfaction/dissatisfaction) to appraisals of stressors.

When related to psychological stress, definitions of stress based on the "desires" of the individual (i.e., psychological needs) may be seen to reflect subtle distinctions in the

view that any discrepancy or misfit between intrinsic demands (i.e., value standards) and supplies (i.e., situational conditions) results in stress and the need to correct the imbalance (Caplan, 1983; Edwards, 1992; French et al., 1974). For instance, Kaplan (1983) defines stress as a result of . . . "disvalued circumstances—those that in reality or fantasy signify great and/or increased distance from desirable (valued) experiential states and, consequently, evoke a need to approximate the valued states" (p. 196). Similarly, Edwards, (1988), defines stress, as . . . "a negative discrepancy between an individual's perceived state and desired state, provided that the presence of this discrepancy is considered important by the individual (p. 242). Whereas for Schuler (1980), stress is defined as a . . . "dynamic condition in which an individual is confronted with an opportunity, constraint or demand for being/on doing what (s)he desires (and which) lead to important outcomes" (p. 189). By contrast, this thesis has defined stress in a more straightforward manner; stress is conceptualised as an imbalance between actual and ideal (i.e., desired) common work stressors. Thus, any imbalance between the recognition (i.e., perception) of work stressors and desired (i.e., "like more" or "like less" of the stressor) work demands relates to stress; or conversely, for an appraised state of congruence (i.e., the appraisal of a stressor as "about right for me"), personal satisfaction with the source of demand. As such, the function role of value standards and the notion of any discrepancy between the appraisal of demands and personal abilities (i.e., mental, physical, social, dispositional and coping effectiveness) may be seen as implicit in the definition (Edwards, 1992).

Edwards (1992) notes, furthermore, that the demand-supplies position may be seen to contrast or parallel the view that a misfit between job demands and the person's ability to satisfy the demand results in stress (e.g., Cox, 1978, Karasek, 1979; McGrath, 1976;

Wall, Jackson, Mullarkey, & Parker, 1996; Payne, 1979b). However, as Edwards further points out, it can also be argued that any mismatch between job demands and abilities is in effect linked to the motives of the individual and the supplies available from the environment. As Van Harrison (1978) in a review of the P-E fit model likewise argued: "Discrepancies between job demands and individual abilities will be related to strain when they result in insufficient environmental supplies for the individual's goals" (p. 181). That is, any mismatch between demands and ability will only relate to stress if there is an associated imbalance between desires and situational conditions (Edwards, 1992). In other words, the substance of this reasoning suggests that the demand-supplies approach (i.e., the desirability of demands) to the measurement of stress may in effect be the more parsimonious and valid approach to the prediction of strain related outcomes. For example, in one of the seemingly rare occasions where stress research has used the desirability of work demands as predictors of strain, French et al.(1982) report that measures of P-E fit derived from commensurate E (i.e., how much of the work demand do you have) and P (i.e., how much of the work demand would you like) items were able to account for an additional 1.5% to 14% of the explained variance in measures of strain. By contrast, this thesis has sought to move beyond the P and E approach to measures of desirability and instead sought to measure the personal desirability of stressors using an imbalance approach to measurement (Cox, 1987, 1990; Cox & Mackay, 1981). It sought to measure the degree of mismatch between actual demands and ideal demands using an evaluative response scale that considers the personal desirability of work stressors in terms of "Like More" "About Right" and "like Less". Table 4.3.1 provides a summary of the theoretical positions and the associated conceptual basis for the discrepancy between value standards and desirability that may be used, or have been used, to measure the personal desirability of intrinsic and extrinsic demands.

Table 3.3.1
The Appraisal and Measurement Of Personal Desirability (Satisfaction): Examples of Theoretical Emphasis, Empirical Focus and Conceptual Basis for the Measurement of Cognitive Imbalance

Author	Theoretical Emphasis	Empirical Focus	Conceptual Basis for Cognitive Imbalance
Arnold (1960); Arnold & Glasson (1968).	Appraisal	Stress & Emotion	Object Encounter: Like - Dislike
Rand (1964)	Moral Values	Cognition	Object, Action or Condition - Values
Locke (1965, 1967, 1968, 1969)	Task Success & Task Liking	Job Satisfaction	Value - Perception Discrepancy - i.e., Desire for success and Perception of task Outcome
Lehman (1972)	Transactional	Socio-Cultural Stress	Congruity-Incongruity
French, Rodgers & Cobb (1974)	P-E Fit	Mental Health	Intrinsic Demands (Desires) - Environmental Supplies
Caplan, et al. (1975); French, et al. (1982)	P-E Fit	Occupational Stress	Actual - Desired
Hackman & Oldham (1975)	Job Characteristics	Motivation (Growth Need Strength)	Actual - Desire for Growth
Vinokur & Selzer (1975)	Life Events	Life Events & Illness	Life Events - Desirability
Locke (1976, 1984)	Value Appraisal	Job Satisfaction	Value-Perception Discrepancy and Importance of Value
Sarason, Johnson & Siegel (1978)	Life Stress	Measurement of Life Change Units	Life Events - Desirability
Cummings & Cooper (1979)	Cybernetic	Occupational Stress	Preferred - Actual
Marshall & Cooper (1979, 1981)	P-E Fit	Job Stress	Pressure - Satisfaction
Payne (1979b); Payne & Fletcher (1983)	Transactional	Job Demands, Supports & Constraints	Demand/Supports/Constraints - Personal Satisfaction
Sarason & Johnson (1979)	Life Change and Stress	Life Stress & Job Satisfaction	Life Change Events and Desirability
Henderson et al. (1980)	Social Support	Social Interaction	Available - Adequacy
Schuler (1980)	Transactional	Organisational Stress	Desire - a) Opportunity, b) Constraint and c) Demand
Kaplan (1983)	Disvalued Circumstances	Psychosocial Stress	Distance From Desired (Valued) States
Kirk, Stanley & Brown (1988)	Congruence	Patient Stress	Patient - Therapist
Payne et al. (1988)	Transactional	Occupational Stress	Demands -Satisfaction
James & James (1989)	Work Values	Psychological Climate	Desire - Work Values
Edwards & Cooper (1990)	P-E Fit	Organisational Stress	Supplies - Values
Edwards (1988, 1992);	Cybernetic	Organisational Stress	Perceived - Desired State
Edwards & Baglioni (1993)	Cybernetic	Coping	Perceived - Desired State

3.3.1.2 The Evaluative Measurement of Common Stressors

Five item evaluative scales based on the semantic differential format (Ajzen & Fishbein, 1980; Osgood et al., 1957) and the use of tripolar response anchors (e.g., Locke, 1976) were designed to measure the direction and intensity of the personal desirability assigned to role-ambiguity, role-boundary, role-insufficiency, role-overload, role-responsibility and physical environment stressors. The design of the scales draws heavily on the bipo-lar or semantic differential approach to measurement (i.e., use of evaluative adjectives to measure the direction and intensity of personal desirability) devised by Osgoodet al.(1957); and the evaluative approach used by Ajzen and Fishbein (1980) to measure attitudes and beliefs associated with intentional behaviours. Chapters 3.2.1.3.2.4, 3.2.1.3.2.4.1 and 3.2.1.3.2.4.2 provide a more detailed coverage of the theoretical basis, conceptual distinctions and the design of evaluative (i.e., semantic differential) response scales to measure the direction and intensity of the personal meaning that individual's assign to objects and events.

With exception of the Physical Environment scale used in Study 5 (see Appendix E, Procedure E.3.4), the five item evaluative scales were formed from the items with the highest factor loadings on the six factor solution (varimax rotation) which resulted from a factor analysis of the 60 item OSI Stressor scale (see Osipow & Spokane,1987, Appendix B, p. 21). Each item in the personal desirability scales was reworded to a form which (a) retained the original intent (i.e. focus) of the OSI item; (b) reduced the length of the item; (c) changed the specificity of the item to generic in nature; and (d) removed the emotional emphasis (if any) from the original item (DeFrank, 1988; Frese & Zapf, 1988; Monroe & Kelley, 1995). That is, the items were reworded to reflect a neutral or non-emotive stimulus and the structure of the scale items to a more general and parsimonious format. For example, the role-insufficiency item "I feel that my career is pro-

gressing about as I hoped it would" was reworded to the neutral and more generic item "Career Progress"; and the Role-Overload item "I work under tight time deadlines" rephrased as "Work with tight deadlines".

In essence, then, the objective of forming neutral stimulus items is to shift the meaning of the item (Monroe & Kelley, 1995) to the tripolar response anchors. That is, the intention is to nullify the emotional nature of the item (Freze & Zapf, 1988) and force the evaluation of the item to the emotional emphasis and latitude of the tripolar anchors (Clarke, 1998; Osgood et al., 1957). The response anchors, therefore, may be seen to function as an external frame of reference which sets the focus and boundary for appraisals (e.g., Madden et al., 1990) of personal desirability. As a result, they may be seen to both enable and provide the individual with the basis by which to make "relative judgments" of neutral items (Smith et al., 1969, p. 16).

The design of the evaluative (i.e., imbalance) response scale originates from a limited review of the stress and job-satisfaction literature that sought to identify the conceptual basis and the methods used to measure the personal desirability of objects and events. As Table, 3.3.1 shows, several approaches may be used to conceptualise the nature of the cognitive imbalance (balance) underling appraisals of desirability; and seemingly, therefore, a diverse array of methods used to measure the nature and intensity of personal desirability. Equally instructive, the examples shown in the table suggest the possibility of a slippage between conceptual models and the measurement of personal desirability (i.e., how does and how well is research able to measure the transactional nature of desirability appraisals).

One method used to measure the personal desirability of job characteristics (or satisfaction with work) and consistent with the methods used by Locke (1965, 1969, 1976), is to adopt the utility of either "would like" or "satisfaction with" response anchor for-

mats to measure the imbalance between actual and ideal conditions. Table 3.3.2 presents examples from research which have used either of these formats to measure the discrepancy between personal desirability and value standards. As the table shows, the response emphasis for the items tends to be embodied in either the item or the emotional emphasis of the response anchors related to the item. For example, the Caplan et al. (1975) item "how much work would you like to have" indicates that the basis for the response is in effect located in the emotional nature (i.e., appraisal) of the item. The response scale "Very little" (1) - "A great deal" (5) providing a unidirectional measure of the intensity of the personal meaning (i.e., appraisal) assigned to the item. By contrast, the Locke (1976) item "satisfaction with temperature" may be seen as essentially neutral in nature; and the associated tripolar response anchors "Much too cold" "Just right" and "Much too hot" seen to embody or determine the nature and direction of the personal meaning (i.e., appraisal) ascribed to the neutral item.

Furthermore, the range of response scales shown in Table 3.3.2 may be categorised as either directional or evaluative in nature. For example, the response scale "Very little" (1) - "A great deal" (5) used by Caplan et al. (1975) may be seen as uni-directional in nature and therefore restricted to measuring the intensity of appraisals. Similarly, those used by Locke (1965) and Hackman and Oldham (1975) may also be seen as uni-directional response scales which measure the intensity of appraisals.

In contrast, the tripolar response scales used by Locke (1969), Locke (1976) and Henderson et al. (1980) may be seen as both measures of intensity and bi-directional in nature. As a result, these differential response scales have the ability to measure both the intensity and direction of appraisals and therefore, may be seen as evaluative (i.e., cognitive imbalance) self-report measures of personal desirability (Locke, 1969; Osgood et al., 1957).

The design of the evaluative scale used in the present research (i.e., studies 5 - 7) to measure the personal desirability of work stressors incorporates the relative strengths of the examples shown in Table 3.3.2 In particular, it embodies (a) the use of neutral items similar to those used by both Hackman and Oldham (1975) and Locke (1976); (b) the "more" "less" and "same" emphasis of the scale item used by Locke (1969; (c) the tripolar response scale formats used by Locke (1969, 1976) and (d) the "About right" anchor used by Henderson et al. (1980). Specifically, differential response scales based on the use of (a) neutral items, (b) the tripolar anchors "Would Like More" "About Right for Me" and "Would Like Less" and (c) the response values (+4) (+3) (+2) (+1) (0) (-1) (-2) (-3) (-4) were designed to measure the intensity and direction of the personal desirability assigned to common work stressors. The positive values (+4) (+3) (+2) corresponding to "Like More" of the stressor; the values (+1) (0) (-1) to "About Right" with the stressor; and the negative values (-2) (-3) (-4) to "Like Less" of the stressor.

Furthermore, the assumption is made that the appraisal of desirability is in essence a personal preference for either "more" "less" or "personal satisfaction" with a particular work stressor (i.e., individual differences in the personal desire or satisfaction for/with a source of stress) in their sphere of work. It assumes, therefore, that individual differences underlying appraisals of desirability are both a reflection and function of the frames of reference (i.e., tripolar anchors or standards) used to elicit the nature (i.e., direction) and intensity of the appraisal.

In addition, although implicit or hypothesised to underpin appraisals of desirability, the nature of the response to a scale item assumes that the individual's value standards or "what's at stake" for the individual (Lazarus et al., 1952; Lazarus & Folkman, 1987)

Table 3.3.2
The Self-Report Measurement of Personal Desirability: Examples of Scale Items and Response Anchors Using "Like Less" "Like More" and "About Right" Response Formats to Measure Personal Desirability

Author	Theoretical Focus	Scale Item (Examples)	Response Scale
Locke (1965)	Task Success, Liking & Satisfaction	"How much did you like this task"	"Liked it very much" (7) - "Strongly disliked it" (1)
Locke, (1969)	Job Satisfaction: Work Week Length and Pay	"How satisfied would you be with "more" "same" or "less" than the minimum amount of pay"	"Less than amount" - "Same amount" - "More than amount"
Caplan, et al. (1975)	Occupational Stress	"How much work load would you like to have"	"Very little" (1) - "A great deal" (5)
Hackman & Oldham (1975)	Motivation: Growth Need Strength	"Stimulating and challenging work"	"Would like this a moderate amount (or less)" (4) - "Would like this very much" (7) - "Would like having this extremely much" (10)
Locke (1976)	Job Satisfaction	"Satisfaction with temperature"	"Much too cold" - "Just right" - "Much too hot"
Henderson et al. (1980)	Social Support (Social Interaction)	"Would you like to have more or fewer friends like this, or is it about right for you"	"Less" (1) - "About right" (2) - "Depends on situation" (3) - "More" (4)

determine the intensity, but not necessarily the direction of the personal desirability assigned to common stressors (Hesketh & Gardner, 1993; Locke, 1969). For instance, it may be the case that socialised norms (i.e., cultural or contextual beliefs and values) or in terms of desirability, facets of work that are "normatively desirable" (Hesketh & Gardner, 1993, p. 317), overrule the person's value standard(s) and thereby decree that the personal desirability assigned to a particular stressor is either desirable or undesirable (Ajzen & Fishbein, 1980; Locke, 1969). For example, the social norms for career progress, utilisation and level of pay may well be seen by society or a social context as essentially desirable facets of work. As a result, the range of responses to such facets of work may in effect approximate a linear or unidirectional distribution. Therefore, it is

logical to argue that university students, for example, would expect their course of study to provide them with a future career; and for people with jobs, a desire for promotion, the use of their skills and abilities and more pay. Alternatively, it may also be the case that some people may in effect appraise their relationship with a particular stressor as congruent or "in balance" (i.e., satisfaction with the stressor) with their value standard and thereby experience a lower level of stress and reduced symptoms of strain (Caplan, 1983; Payne, 1979b).

3.3.1.3 Transformation of Responses to Expectancy/Valence, Personal Desirability And Psychological Strain Scales

The hypothetical distribution of the responses to the desirability scale and their relationship with strain is shown in Figure 3.3.1 and reflects the definition of stress used by the thesis to underpin the measurement and explanation of the transactional process underling stress and strain related outcomes (Caplan, 1987; Caplan et al., 1975; Edwards & Cooper, 1990, French et al., 1982; Kahn & Byosiere, 1992; McGrath, 1970b, 1970c; Schabracq & Cooper, 1998). As the definition states: any imbalance between actual (i.e., recognition of stressors) and ideal (i.e., personal meaning of stressors) work stressors reflects as stress.

Therefore, in accord with the definition of stress and as the figure indicates, the use of an evaluative scale to measure the personal desirability of stressors renders a simple summation of positive and negative responses to the scale items as in effect invalid. Furthermore, it is necessary to transform the non-linear distribution of the responses to approximate a linear relationship with strain. In other words, the algebraic addition of the scores is in effect inappropriate as it (a) contradicts the stated definition of stress and (b) assumes that the residual from the imbalance scores (e.g., (+4) + (-2) = 2) is a linear measure of stress. Such may be the case, however, for the summation of scores

derived from bipolar scales with an underlying positive to negative continuum. For example, the measurement of attitudes using the bipolar anchors "good" "bad" produces a range of scores which may be summed algebraically; the polarity and magnitude of the resultant residual reflecting the direction and intensity of the attitude. Alternatively, it is possible to convert the imbalance response scale (e.g., +3 - 0 -3) to a uni-directional scale (e.g., 1 - 7) and sum the scores.

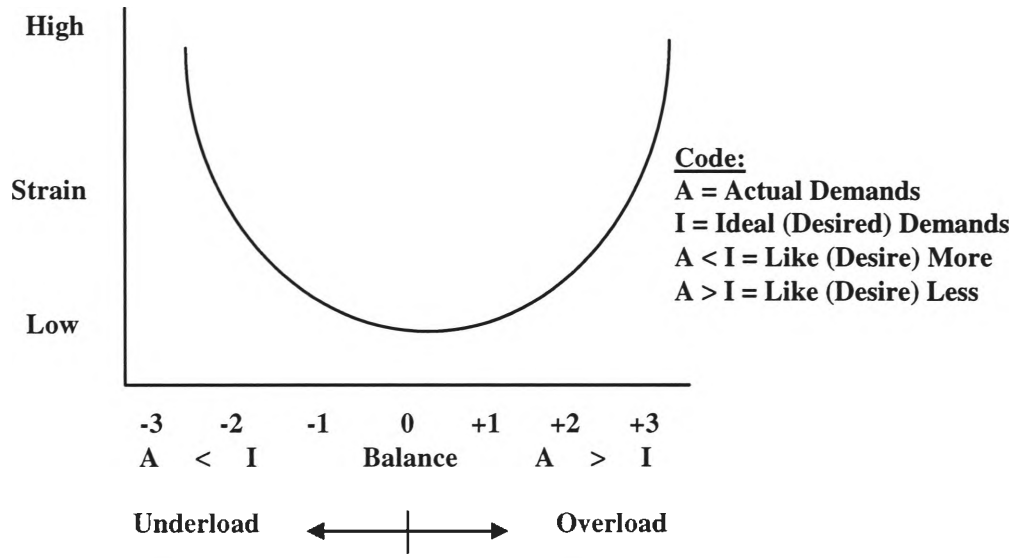


Figure 3.3.1 The Hypothetical Transactional Relationship Between the Appraisal of an Imbalance Between Actual and Ideal Demands and Strain (After Caplan, 1975, Figure D-1, p. 221)

For the desirability scale, however, to transform the range of item responses to approximate a linear relationship with strain, it is necessary to convert the negative scores to positive values and then sum the scores for the respective scales. As French et al. (1982) point out:

> When the theoretical relationship between P-E fit (i.e., in this case desirable - undesirable) and strain is U shaped, strain increases as P-E fit becomes either greater than zero or less than zero. This relationship can be made approximately linear by taking the absolute value of the P-E fit scores (p. 37).

Similarly, due to the differential nature of the Psychological Strain scale (i.e., "Most of Time" "0" "Rarely or Never"), the range of positive and negative responses to items in the scale are likely to reflect a hypothetical U shaped distribution. However, in contrast to the desirability scale, the underlying distribution of the scale may be seen to fall on a continuum which ranges from "high" to "low" strain. As a result, it is valid to transform the range of scores to approximate linearity by recoding the scores from the differential range "+3" "0" "-3" to the corresponding uni-directional range, "7" - "1".

3.3.2 Summary of Evaluative Research

Study five reports a field study which sought to explore the psychometric properties and the relative effect of an evaluative (i.e., cognitive imbalance) response scale that was designed to measure the personal desirability of common work stressors. Essentially, it sought to show that the individual's cognitive evaluation of work stressors in terms of their personal desirability accounts for a significant percentage of the variance in symptoms of strain.

In addition, the study sought to test the hypothesis that an evaluative (i.e., imbalance) approach to the measurement of work stressors has the inherent ability to capture the personal meaning assigned to work stressors in terms of (a) personal demand and (b) their personal satisfaction with sources of stress. In other words, an evaluative approach to measurement may be seen as a measure of personal imbalance that reflects (a) over (i.e., like less) and under (i.e., like more) personal demand (Cooper, 1983; Cox, 1978; Cox, 1985a; Cox, Leather & Cox, 1990; Katz & Kahn, 1978; McGrath, 1970b,

1976), (b) satisfaction with the nature of common work stressors (Caplan, 1987; Locke, 1969, 1976) and (c) relationships with strain that correspond to the personal desirability of the stressor (Edwards, 1988; James & James, 1989; Kaplan, 1983; Kirk, Stanley, & Brown, 1988; Locke, 1969, 1984; Vinikur & Selzer, 1975). That is, the appraisal of a personal imbalance with a work stressor is hypothesised to reflect a positive relationship with strain; the appraisal of personal balance or satisfaction with a common work stressor, an inverse relationship with strain.

Study six was designed to further explore the design of evaluative response scales and the relative effect of (a) the personal desirability of common stressors and (b) dispositions for hardiness on symptoms of strain. In addition, it sought to test the hypothesis that the incremental effect of the personal desirability assigned to common stressors would add significant information to the cumulative variance when placed in the presence of dispositions for hardiness (self-evaluations which reflect individual differences in dispositions for control, commitment and challenge) and common stressors. That is, the study sought to further demonstrate the theoretical importance and relative significance of specific and more general appraisal processes in the mental summation of the imbalance between actual and ideal demands.

Study seven sought to explore three principal aims. First, it sought to triangulate the results obtained from previous studies which had used "frequency" as the basis to measure and explain the relative effect of common work stressors on symptoms of strain. Second, it sought to identify a model of best fit from the measurement models used in the series of expectancy/valence studies (i.e., studies one to four) and evaluative studies (i.e., studies five and six). Third, and relative to the principal aim of the thesis, the study sought to draw the findings from the two series of studies together and distin-

guish the relative significance of personal meaning in the transactional process underlying the relationship between stressors and strain. That is, it sought to identify the relative importance or unique effect of (a) expectancy, (b) valence, (c) personal desirability, (d) personal beliefs, (e) secondary appraisal coping strategies and (f) personality cognitive styles on the variance in symptoms of strain.

A series of hierarchical modelling analyses were used to demonstrate support for the principal aim of the thesis and test the principal hypothesis for the study. First, they sought to identify the extent to which common stressors (i.e., recognition of stressors) contribute unique information to the explained variance. Second, they sought to demonstrate the theoretical (i.e., logical) importance of personal desirability dimensions of appraisal in the stressor to strain process. Third, and foremost to the principal aim of this thesis, they sought to test the hypothesis that the personal desirability of common stressors adds significant information to the explained variance when placed in the presence of (a) dispositions for hardiness, (b) common stressors, (c) coping strategies and (d) personal demands (i.e., the appraisal of stressors in terms of expectancy, belief and valence).

Study 5

The Personal Desirability of Common Work Stressors and Their Relationship With Symptoms of Strain

3.3.3.1 Introduction

A detailed description of this study and critical discussion of the findings from this study is presented in Appendix E.

Study 6

The Relative Importance of the Personal Desirability Assigned to Common Study Stressors In Stress at University

3.3.4.1 Abstract

This study sought to explore the relative effect of the personal desirability (i.e., the appraised imbalance between actual and ideal stressors) assigned to common study stressors on symptoms of strain. The results from 162 undergraduate students show that the personal desirability of common study stressors accounts for a small but significant percentage of the variance in symptoms of strain when either "in" or "placed in" the presence of common study stressors and dispositions for hardiness. For example, when included in the presence of common study stressors, the personal desirability assigned to role-insufficiency stressors accounts for an additional 1.50% (adj) of the variance in physical strain; a slightly higher 1.60% (adj) of the variance in psychological strain; and 1.65% (adj) of the variance in a composite measure of strain. Furthermore, when included in the presence of significant predictors of strain, (i.e., models of best fit), the personal desirability assigned to Role-Insufficiency stressors accounts for variance in strain beyond that explained by common study stressors and dispositional tendencies for hardiness.

Hierarchical modeling subsequently confirmed the logical importance and incremental effect of personal desirability in the transactional model. The desirability of role-insufficiency stressors adds a significant 4.30% (4.00% adj) to the variance in strain explained by (a) dispositional tendencies for control and challenge (i.e., 30.50% - 29.70% adj) and (b) role-boundary stressors (i.e., 7.10% - 6.80% adj). As a result, there

was support for the hypothesis that the personal desirability of common study stressors would account for variance in strain beyond that explained by dispositions for hardiness and common study stressors (i.e., recognition of stressors).

In addition, the results further illustrate the multifunctional utility or the versatility of evaluative (i.e., imbalance) response scales when used to measure and discriminate the personal desirability assigned to stressors. As the results show, when measured in terms of "Like More" "About Right" and "Like Less", each domain of personal desirability explains a significant percentage of the variance in strain. When appraised in terms of "Like More", the personal desire for more role-insufficiency and role-ambiguity stressors explained a moderate 16.50% (15.40% adj) of the variance in composite strain; when stressors are appraised in terms of "Like Less", however, the desire for less physical environment stressors (e.g., erratic lecture and tutorial schedules) accounts for a somewhat lower 4.00% (3.40% adj) of the variance in composite strain. By contrast, when stressors are appraised in terms of "About Right" (i.e., personal satisfaction with stressors), the personal satisfaction with the nature of role-insufficiency and role-ambiguity stressors explains a moderate 15.70% (14.70% adj) of the variance in physical strain; a reduced 11.80% (i.e., 10.70% adj) of the variance in psychological strain; and an increased 16.90% (15.80% adj) of the variance in a composite measure of strain. Therefore, when seen collectively, these results indicate that individual differences in the desirability of stressors may be seen to underpin the personal discrimination (i.e., appraised imbalance between actual and ideal stressors) of common study stressors.

Furthermore, the results show that the nature of the personal desirability assigned to stressors is related to a corresponding increase or decrease in symptoms of strain. Specifically, increases in the desire for "more" or "less" of a stressor relate to an increase in

symptoms of strain; and the appraisal of congruence with a stressor, to an associated decrease in symptoms of strain. Moreover, when related to incremental increases in the personal desirability (i.e., dissatisfaction or satisfaction) of stressors, there are significant differences between the mean strain scores corresponding to (a) "Like More" and "About Right" and (b) "Like Less" and "About Right" appraisals of personal desirability. As a result, there is evidence to suggest (a) that people are able and do discriminate the relevance of common study stressors in relation to their value standards and (b) a linkage between the transactional process underlying stress (i.e., the appraisal of an imbalance or balance between actual and ideal demands) and symptoms of strain. Limitations of the research and directions for future research are discussed.

3.3.4.2 Introduction

The results from study five indicate that the personal desirability assigned to common work stressors per se contribute useful information to the explained variance in symptoms of strain. However, although significant in its own right, this result may in effect be somewhat misleading as the study failed to consider the relative effect or functional involvement of other dimensions of appraisal and processes of appraisal in the transactional model. In particular, the study failed to include measures that considered the individual's perception of actual work demands (i.e., the recognition of common stressors), their self-evaluation of dispositional tendencies (i.e., cognitive styles) and their preference for coping strategies in the process of stress. As the results from studies one to four demonstrate, the person's recognition of common stressors, dispositions for neuroticism and the use of coping strategies each function as significant predictors of strain. Therefore, it may be the case that appraisals concerned with personal desirability of stressors are confounded or in effect rendered insignificant by either or both more spe-

cific (e.g., the recognition of stressors) or more general (e.g., personality appraisals) cognitive processes. If this is so, then the personal desirability of stressors may in effect fail to function as significant predictors of strain.

Therefore, considering the conceptual limitations underlying the results from study five, it is necessary to further explore the relative effect of appraisals related to the personal desirability on symptoms of strain when measuring both cognitive (i.e., recognition of common stressors) and dispositional (e.g., neuroticism, hardiness) appraisal processes. However, when this conceptual model is seen in transactional terms, it follows that the transactional process underlying the appraisal of an imbalance between actual and ideal stressors is logically and essentially commensurate in nature. That is, following the recognition of a source of stress, the person may then (a) appraise the relevance of the source of stress to either their personal well-being or the well-being of others and (b) decide to reduce or counteract the source of stress (Anshel et al., 1997; Folkman & Lazarus, 1985, Locke, 1969). It follows, therefore, that measures of the reciprocal interaction between actual and ideal appraisal processes which are semantically dissimilar in nature are in effect invalid; and furthermore, they may be seen to invalidate the findings of stress research based on transactional principles. Therefore, to ensure conceptual conformity and thereby support for the transactional model of stress, it is imperative that research adopt a commensurate approach to the measurement of both recognition and appraisal cognitive processes (Caplan, et al, 1975, Caplan, 1987, Cox & Ferguson, 1994; Edwards & Cooper, 1990; French et al., 1982; Hesketh & Gardner, 1993).

Furthermore, the results from study four indicate that dispositions for neuroticism function as both predictors (i.e., direct effects) and moderators of the transactional process underlying symptoms of strain. However, the controversial nature of this disposi-

tional construct suggests that it has, at best, only cautious acceptance in the field of stress research (Allred & Smith, 1989; Bohle, 1997; Schroeder & Costa, Jr., 1984; Funk & Houston, 1987; Heinisch & Jex, 1997, 1998; Hurrell Jr. et al., 1998; Jex & Spector, 1996; Moyle 1995; Parkes, 1994; Payne, 1988b; Semmer et al., 1996; Walsh et al., 1997). Thus, it would seem that this personality style has only limited relevance and utility in the explanation of occupational stress.

Of particular concern, a body of research indicates that neuroticism correlates with dispositions for hardiness (Benishek & Lopez, 1997; Bohle, 1997; Cox & Ferguson, 1991; Funk & Houston, 1987) and thus may in effect act to confound the relationship between hardiness and strain. However, as Benishek and Lopez (1997) further point out, the correlations range from a low 0.24 to a maximum of 0.62 and as such may be considered as not large enough to . . . "indicate that hardiness and neuroticism are completely redundant constructs" (p. 35). Accordingly, on the basis of these correlations, it is reasonable to concluded that neuroticism and hardiness are relatively independent personality constructs (Tabachnick & Fidell, 1989).

The correlations between neuroticism and hardiness do, however, indicate conceptual limitations in the functional relevance of neuroticism in the occupational sphere. In short, neuroticism may be seen as a more general measure of personal maladjustment or emotional instability. As a result, it may be seen as a construct which is essentially unable to either capture or discriminate the more specific personality dispositions (e.g., personal control, self-efficacy, Type A) known to underpin work performance and well-being in the organisational sphere (Parkes, 1994; Payne, 1988a).

Therefore, it is logical to argue that measures of neuroticism should be replaced with a dispositional measure which is more relevant to the organisational domain; one which better reflects the nature of the transactional relationship between the individual and

their work environment. For example, the hardiness construct may be seen as a preferred dispositional construct (Kobasa, 1979). It is considered to embrace dimensions of individual differences which reflect dispositions for control, commitment and challenge (Bartone et al., 1989; Bohle, 1997; Hull, Van Treuren, & Virnelli, 1987). That is, the hardiness construct may be seen to embody the individual's use of appraisal strategies which reflect their (a) ability to control work related events; (b) commitment to work activities and/or the goals of an organisation; and (c) belief that work activities and exposure to change are sources of personal challenge which underlie job satisfaction and personal development (Bohle, 1997; Benishek & Lopez, 1997; Bartone et al., 1989; Cox & Ferguson, 1991; Kobasa, 1979).

The present study had three aims. First, it sought to further explore the evaluative (i.e., imbalance approach to self-report measurement) measurement of the personal desirability assigned to common work stressors. Second, it sought to identify both the relative and incremental effect of the personal desirability assigned to common study stressors on symptoms of strain when in the presence of (a) common study stressors and (b) dispositions for hardiness. Third, it sought to further explore the relationship between the appraisal of stressors as either (a) desirable (i.e., "Like More"), (b) undesirable (i.e., "Like Less") or (c) congruent with the person's value standards (i.e., "About Right") and symptoms of strain. In addition, the study sought to further explore the relationship between stressors and strain using physical, psychological and composite measures of strain (see Appendix F.2). These aims are summarised as a test of the following hypotheses:

H1 That the personal desirability assigned to common study stressors will account for a significant percentage of the variance in symptoms of strain when (a) "in the presence" or (b) "placed in the presence" of common study stressors and dispositions for hardiness.

H2 That the desirability of common study stressors when measured in terms of (a) desirable, (b) undesirable and (c) congruence will each contribute significant in formation to the explained variance in symptoms of strain.

H3 That increases in the desirability or undesirability of common study stressors will correspond to an increase in symptoms of strain; conversely, for increases in the congruence (i.e, satisfaction) with stressors, to a decrease in symptoms of strain.

H4 That the mean strain scores corresponding to the desirability or undesirability of common study stressors will be significantly higher than mean strain scores corresponding to congruence (i.e., satisfaction) with stressors.

3.3.4.3 Method

3.3.4.3.1 Participants

A total of 163 first year psychology undergraduate students took part in the study. Of these, 77 were male and 67 female. The mean age of the participants was 23.6 years and ranged between 18 years and 54 years.

3.3.4.3.2 Self-Report Measurement

Self-Report scales were used to measure (a) the recognition (i.e., description) of common study stressors; (b) evaluations of the personal desirability of common study stressors; and (c) hardiness cognitive styles. In addition, self-report measures of physical and psychological strain were included in the inventory to measure the symptoms of strain more recently experienced by the students participating in the present study (see Appendix F.3, Stress at University Survey).

3.3.4.3.2.1 The Measurement of Common Study Stressors

The five item short form scales used in study two (see Chapter 3.2.2.3.2.4) were used to measure the frequency of common study stressors (see Appendix F.3.1, Study Demands Questionnaire). As discussed in the method for study two, the items used in

the scales were constructed from the five items with highest factor loadings on the six factor solution (varimax rotation) which resulted from a factor analysis of the 60 OSI stressor items (see Osipow & Spokane,1987, Appendix B, p. 21). Where necessary, the items were modified to reflect the nature of common study stressors relevant to the university context. For example, the OSI role-insufficiency item "I feel that my career is progressing about as I hoped it would" was reworded to the item "I feel that my coursework is progressing about as well as I hoped it would"; and similarly, the role-overload item "I work under tight time deadlines" was rephrased to "I have to study under tight time deadlines". However, in contrast to the response format "Yes" (3) "?" (1) and "No" (0) used in study two, the tripolar response anchors "Most of the Time" "Now and Then" "Mostly Never" and six point response format (i.e., range +3 +2 +1 -1 -2 -3) were used to measure the individual's response to scale items.

The results from study two indicate that the common stressor scales hold reasonable psychometric properties (see Appendix B.1.1 & Table B.1). With the exception of the Physical Environment scale which was not used in study two, the internal consistency of the respective scales tends to be moderate in nature; the alpha coefficients range from a minimum of 0.59 to a maximum of 0.68 (see Table B.1). In addition, the correlations between the five scales ranged from a minimum of 0.05 (ns) to a maximum of 0.47** and suggest that the scales are relatively independent in nature. Furthermore, each of the scales correlates significantly with dimensions of strain (see Table 3.2.2.2). As a result, the common stressor scales may be seen to reflect predictive validity (Edwards, 1991).

3.3.4.3.2.2 The Evaluative Measurement of Common Study Stressors

Five item evaluative scales based on the semantic differential format (Ajzen & Fishbein, 1980; Osgood et al., 1957) and the use of tripolar response anchors (e.g., Locke, 1976) were used to measure the direction and intensity of the personal desirability assigned to role-ambiguity, role-boundary, role-insufficiency, role-overload, role-responsibility and physical environment study stressors (see Appendix F.3.6, Study Demands Evaluation Questionnaire). However, in contrast to study five, the items used in the Physical Environment scale were devised from items used in the OSI Physical Environment scale (see Chapter 4.4.3.2.1). Chapters 3.3.2, 3.3.2.1 and 3.3.2.2 provide a detailed coverage of the theoretical basis, design and transformational issues underlying the application of evaluative response scales (i.e., tripolar differential scales) to measure both the direction and intensity of the personal meaning (i.e., personal desirability) that individual's impute to stimulus objects and events. Furthermore, in response to the seemingly inordinate tendency of the participants in study five to exercise a neutral or zero response to scale items (see Appendix E.4.2.1, Table E.4), the neutral or zero option was eliminated from the response options and the range of response options reduced to the values (+3) (+2) (+1) (-1) (-2) (-3).

3.3.4.3.2.3 Measurement of Hardiness

A short form 30 item version (see Appendix F.3.4, Life Disposition Scale) of the hardiness measure originally developed by Kobasa, (1979) was used to measure the dimensions of dispositional hardiness (Bartone et al., 1989). As Bartone et al., note, Kobasa's original 76 item scale was reduced to 45 items by using high item-scale correlations as the basis by which to select items for the modified scale. Furthermore, they report that a subsequent principal components factor analysis of the 45 hardiness items and varimax

rotation of the factor solution revealed the orthogonal factors control, commitment and challenge. In addition, it is possible to extract a short form 30 item hardiness scale from the 45 item modified scale; that is, form 10 item scales which measure the individual's appraisal of control, commitment and challenge. Bartone et al., report Cronbach alpha coefficients of 0.66, 0.82 and 0.62 for the respective long form scales; and a moderate alpha coefficient of 0.82 for the 30 item short form scale.

3.3.4.3.2.4 Measurement of Symptoms in Strain

The multidimensional 20 item Personal Health scale used in studies two, three and four (see Appendix F.3.5, Personal Health Scale) was used to measure how frequently the participants suffer from symptoms of physical strain (Osipow & Spokane, 1983, 1987; Smith & Bennett, 1983). In addition, the 10 item Psychological Strain scale from the OSI inventory (Osipow & Spokane, 1983, 1987) was used to measure how often the participants have more recently experienced symptoms of psychological strain (i.e., negative mood states and problems of adjustment) - (see Appendix F.3.2, Psychological Strain Scale). Furthermore, a 30 item Composite Strain scale may be formed from the items used in the Physical and Psychological Strain scales. Chapter 3.2.2.3.2.2 provides a more detailed description of these scales.

In contrast to the response formats used in previous studies, however, participants used a six point differential response format and the response anchors "Most of the Time" (+3) "Often (+2) "Now and Then (+1 and -1) "Seldom" (-2) and "Rarely or Never" (-3) to measure their response to the items in the Psychological Strain scale. Further, with one exception, the response format used for the Physical Strain scale was essentially the same as that used for the Psychological Strain scale; the anchor "Most of the Time" was changed to "Very Often".

3.3.4.3.3 Design and Materials

This correlational field study required participants to answer an inventory with six questionnaires and a total of 125 items. Furthermore, due to the reasonable length of the questionnaire, volunteer participants and no set time to complete the inventory, problems such as mental fatigue, boredom with the task and carry-over effects were not expected to adversely influence the reliability and validity of the responses to scale items.

3.3.4.3.4 Procedure

Participants were approached in lectures and tutorials and asked if they would like to participate in the research. In addition, they were advised that the questionnaire would take around 30 minutes to complete and that participation in the research would attract a credit of one credit point toward their final grade for the course. Following a brief outline of the questionnaire, it was then distributed to participants. Participants were asked to return their completed questionnaires to the researcher or alternatively, they would be collected from the participants during tutorials. Using this method of distribution, 294 students volunteered to take part in the study. Of these, 163 returned completed questionnaires, a response rate of 55.4%.

3.3.4.4 Results

3.3.4.4.1 Data Screening and Assumptions for Normality

Descriptive statistics, frequency plots and a series of multiple regression analyses were used to screen the raw data (n = 163) for evidence of (a) random and non-random missing values, (b) violation of the assumptions for normality and linearity and (c) the presence of univariate and multivariate outliers in the data set (Brown & Di Milia, 1995; Orr et al., 1991; Tabachnick & Fidell, 1989).

A total of 81 missing values was evident throughout the data set and averaged 0.65 per variable across the 125 variables in the data set. These ranged from a minimum of one for 29 of the variables, two for 12 of the variables, three for four of the variables and a maximum of 16 for the biographical item "Average for Coursework". In addition, with the exception of the response to the item "Average for Coursework", there was no evidence of any consistency in the distribution of the missing values for either specific participants or variables in the questionnaire. The missing values were subsequent replaced with the scale response value closest to the mean value for the variable (i.e., variables 7 to 125) or the mean value for the variable (i.e., "Average for Coursework").

Frequency plots were used to explore the normality of the variables used in the measurement model. Where necessary univariate outliers and values distant from the general distribution were recoded to values less distant from the next most deviant value in an attempt to improve the normality of the data distribution (Tabachnick & Fidell, 1989). Variables with extreme skew coefficients (see Appendix F.1.1.1, Table F.1) were then transformed to approximate normal distributions using either square root, logarithmic or inflection transformations of the data (Dooley et al., 1987; Stone & Hollenbeck, 1989).[1]

In addition, a series of regression analyses explored the data for evidence of multivariate outliers. From these analyses one case was identified as a multivariate outlier and thus removed from the data set. The remaining 162 cases in the data set provide the desired power of 0.80 at α .05 (Two Tailed) with which to detect a significant medium effect size (ES) of 0.15 from the effect of $k = 8$ independent variables (IV's) in a multi-

[1] See footnote 1, Chapter 3.2.2.5.1, re values for skewness. This study has adopted a more conservative approach to normality and used an alpha level of .023 to determine maximum skewness. Skew coefficients greater than two SE's (i.e., 0.382) were considered to reject the null hypothesis for skewness.

ple regression model (see Cohen & Cohen, 1983, p. 118).[2] Specifically, to achieve a desired statistical power of 0.80, requires a minimum of 107 cases (Cohen, 1992, Table 2, p.158). Furthermore, the case to IV ratio of 20.25:1 exceeds the requirement for a minimum of five cases to each IV in multiple regression analyses (Tabachnick & Fidell, 1989).

3.3.4.4.2 Descriptive Statistics

Descriptive statistics (n = 162) for the scales used in the analyses are shown in Appendix F.1.1.1, Table F.1; the frequency of the responses and "goodness of fit" statistics for the "like More" "About Right" and "Like Less" response options of evaluative scale in Appendix F.1.1.2, Table F.2; and descriptive statistics for the "like More" "About Right" and "Like Less" response options of the evaluative scale in Appendix F.1.1.3, Table F.3.

3.3.4.4.3 Scale Correlations

Pearson zero-order correlations (n = 162) for the common study stressor, personal desirability and hardiness scales with dimensions of strain are shown in Table 3.3.4.1. Further, the sample size n = 162 provides a desired minimum power of 0.80 at α 0.05 (Two Tailed) with which to detect a medium ES of r =0.30. As the tables for power provided by Cohen (1992) indicate, to detect a medium ES or population r of 0.30 at α 0.05 (Two Tailed) requires a minimum sample size of n = 85 (see Table 2, p. 158) to achieve a minimum power of 0.80. The correlations reflect two-tailed tests for significance at $\alpha \leq$ 0.05* or 0.01** as indicated.

---

[2] See footnote 2, Chapter 3.2.2.5.1 for a discussion on the calculation of desired power for single set multiple regression analyses.

Common Study Stressors with Strain

Although generally low, correlations between the common study stressors scales and dimensions of strain are all significant and range from a minimum of 0.17* to a maximum of 0.37** (see Table 3.3.4.1). By contrast, those between the stressor composite scale and strain are moderate and range from a minimum 0.42** to a maximum of 0.48** for the correlation with the Composite Strain Scale.

Correlations between the strain scales, however, tend to be multicollinear and range from a minimum of 0.68** between the Physical and Psychological strain scales to a maximum of 0.95** between Physical and Composite Strain scales. In addition, the Psychological Strain scale correlates 0.87** with the Composite Strain scale. In short, the correlations indicate (a) that the Physical and Psychological Strain scales are relatively independent measures of strain and (b) that the Composite Strain scale carries information which is relative to both the Physical and Psychological Strain scales. That is, the composite scale may be seen as a multidimensional or more general measure of strain which measures both physical and psychological facets of strain.

Common Study Stressor Correlations

Correlations between the common stressors scales are generally low and range from a minimum of 0.03 (ns) to a maximum of 0.46** between the ambiguity and insufficiency scales. As a result, it is reasonable to conclude that the common study stressor scales are relatively independent in nature. In addition, correlations between the stressor scales and the Composite Stressor scale are all moderate. They range from a minimum of 0.52** to a maximum of 0.72** between the boundary and composite scales and indi-

cates that the composite scale carries information which is common to each stressor scale; that is, they indicate that the Composite Stressor scale may be used as a generic measure of common study stressors.

In contrast, the correlations between the common study stressor and personal desirability scales (see Table 3.3.4.1) are generally low or not significant; the significant correlations ranging from a minimum of 0.19* to a maximum of 0.48** between the Physical Environment scales. In addition, the correlations between the Composite Stressor scale and the desirability scales tend to be low and range from a minimum of 0.12 to a maximum of 0.47** with the Role-Ambiguity scale and 0.49** with the Composite Personal Desirability Scale. Thus, on the basis of these correlations, the common study stressor and personal desirability scales may be seen as relatively independent measures of the respective constructs.

Furthermore, with the exception of those with the Challenge scale, the inverse correlations between the common stressor and hardiness scales are generally significant and range from a minimum of -0.17* to a maximum of -0.50** between the Role-Insufficiency and Commitment hardiness scales. In addition, correlations with the Hardiness scale range from -0.15* to maximum of -0.39** between the Role-Ambiguity and Hardiness scales; and those between Composite Stressor scale and the hardiness scales from a not significant -0.11 with the Challenge scale to a maximum of -0.58** with the Commitment scale. In other words, with the exception of dispositions for challenge, the correlations indicate (a) a low to moderate overlap or correspondence between the recognition of common stressors and dispositions for control, commitment and general hardiness and (b) an inverse relationship between the perception of common stressors and dispositions for hardiness.

Personal Desirability Scales

Correlations between the personal desirability scales and strain are either low or not significant and range to a maximum of 0.30**. In particular, the personal desirability of role-ambiguity stressors correlates 0.29** with physical strain, 0.24** with psychological strain and 0.28** with composite strain; and similarly those for the desirability of role-insufficiency stressors, 0.28** with physical strain, 0.27** with psychological strain and 0.30** with composite strain. Furthermore, correlations between the Composite Personal Desirability scale and strain are all significant and range from a minimum of 0.23** to a maximum of 0.28** with the Physical and Composite Strain scales.

Correlations between the personal desirability scales, however, are all significant and range from a low 0.25** to a moderate 0.45** between the Role-Ambiguity and Role-Insufficiency scales and similarly with the Physical Environment scale. Consequently, it is reasonable to conclude that the personal desirability scales are relatively independent measures of the personal desirability assigned to common study stressors (Tabachnick & Fidell, 1989). Furthermore, the overlap in the correlations suggest that the measures of personal desirability may in effect reduce to more general or generic measures of personal desirability.

In addition, correlations between the personal desirability scales and the Composite Personal Desirability scale are moderate and range from a minimum of 0.61** to a maximum of 0.77** with the ambiguity scale. As a result, the composite scale may be seen to carry information which is common to each scale and therefore may be used as a valid substitute for the more specific personal desirability scales. By contrast, the correlations between personal desirability and the hardiness scales are, in the main, not significant and range to a maximum of -0.32** between the overload and commitment scales.

Similarly, the correspondence between the Composite Personal Desirability scale and each hardiness scale is low and ranges from a minimum of 0.04 to a maximum of -0.25** with the Commitment scale. Thus, on the basis of these results, the data suggests that appraisals of personal desirability and dispositions for hardiness may be seen as relatively independent cognitive processes.

Hardiness

Correlations between the hardiness scales and strain are generally moderate and indicate an inverse relationship between hardiness and strain. They range from a low -0.25** between dispositions for challenge and physical strain to a maximum of -0.58** between the Hardiness scale and Composite Strain scale. That is, the strong inverse relationship between hardiness and composite strain (i.e., -0.58**) indicates that hardiness cognitive styles explain a high 33.64% of the variance in symptoms of composite strain. Furthermore, the correlations between the hardiness scales range from a low 0.20** to a maximum of 0.70** between the Control and Commitment scales. As a result, this suggests that (a) either the control or commitment dimensions of hardiness may be redundant, (b) the scales may reduce to a common dimension and (c) the dimension of challenge is a relatively independent facet of hardiness. In addition, correlations with the generic Hardiness scale range from 0.62** for the Challenge scale to a maximum of 0.84** for the Control and Commitment scales. This indicates that the general Hardiness scale may be seen as sufficiently uni-dimensional in nature to be considered as an independent measure of hardiness cognitive styles. Therefore, this scale may be seen as a valid substitute for the more specific Control, Commitment and Challenge hardiness sub-scales.

Table 3.3.4.1
Correlations: Common Study Stressor, Personal Desirability, Hardiness and Strain

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Common Stressor																				
1. Role Ambiguity	----																			
2. Role-Boundary	.24**	----																		
3. Role-Insufficiency	.46**	.30**	----																	
4. Role-Overload	.26**	.39**	.27**	----																
5. Role-Responsib	.03	.38**	.11	.22**	----															
6. Physical Environ	.31**	.32**	.28**	.25**	.08	----														
7. Composite Stressor	.61**	.72**	.65**	.63**	.52**	.58**	----													
Personal Desirability																				
8. Role Ambiguity	.42**	.38**	.25**	.36**	.07	.31**	.47**	----												
9. Role-Boundary	.22**	.34**	.07	.14	.14	.20**	.30**	.44**	----											
10. Role-Insufficiency	.24**	.30*	.28**	.19*	.22**	.15	.38**	.45**	.35**	----										
11. Role-Overload	.22**	.26**	.27**	.41**	.07	.24**	.39**	.44**	.36**	.36**	-----									
12. Role-Responsib	.13	.11	.07	.04	.02	.08	.12	.36**	.42**	.34**	.40**	----								
13. Physical Environ	.15	.16*	.08	.15	-.01	.48**	.26**	.45**	.41**	.37**	.30**	.25**	----							
14. Comp Pers Desir	.35**	.38**	.27**	.33**	.14	.36**	.49**	.77**	.69**	.72**	.69**	.61**	.67**	----						
Hardiness																				
15. Control	-.42**	-.21**	-.37**	-.26**	-.08	-.30**	-.43**	-.23**	-.08	-.05	-.12	-.04	-.13	-.18*	----					
16. Commitment	-.44**	-.33**	-.50**	-.39**	-.17*	-.35**	-.58**	-.23**	-.09	-.15	-.32**	-.06	-.10	-.25**	.70**	----				
17. Challenge	-.04	-.06	.04	-.21**	-.10	-.03	-.11	.05	.08	-.01	-.00	.09	-.02	.04	.24**	.20**	----			
18. Hardiness	-.39**	-.27**	-.37**	-.38**	-.15*	-.30**	-.50**	-.18*	-.04	-.09	-.20*	-.01	-.11	-.17*	.84**	.84**	.62**	----		
Strain																				
19. Physical	.30**	.32**	.25**	.32**	.17*	.20**	.42**	.29**	.16*	.28**	.16*	.03	.15	.28**	-.49**	-.46**	-.25**	-.52**	----	
20. Psychological	.26**	.34**	.27**	.37**	.24**	.24**	.46**	.24**	.11	.27**	.08	-.01	.18*	.23**	-.45**	-.45**	-.40**	-.56**	.68**	----
21. Composite Strain	.32**	.37**	.29**	.36**	.22**	.24**	.48**	.28**	.15	.30**	.14	.01	.17*	.28**	-.51**	-.50**	-.32**	-.58**	.95**	.87**

Note: n = 162; *p ≤ .05, **p ≤ .01 (Two-Tail); Comp: Composite Scale From Sum of Sub-Scales

3.3.4.4.3.1 Comparison Of Original and Transformed Scales

Table 3.3.4.2 compares the correlations between the original and transformed common study stressor and personal desirability scales (see Table 3.3.4.1) with dimensions of strain. As the table shows, the effect of transformation of skewed distributions does not necessarily increase the correlations with strain; or at best, may only slightly increase the correlations with strain. Furthermore, due to transformation effects on the distribution of data, the transformation of variables may in some cases reverse the direction of correlations.

Table 3.3.4.2
Correlation Comparison: Original and Transformed Common Study Stressor and Personal Desirability Scales With Dimensions of Strain

Transformed Scales	Strain Scales					
	Physical		Psychological		Composite	
	Original#	Trans#	Original#	Trans#	Original#	Trans#
Common Study Stressor						
Role-Ambiguity	.30**	.31**	.26**	.26**	.32**	.33**
Role-Boundary	.32**	.32**	.34**	.34**	.37**	.37**
Role-Overload	.32**	-.32**	.37**	-.37**	.36**	-.36**
Role-Responsibility	.17*	.17*	.24**	.25**	.22**	.23**
Personal Desirability						
Role-Ambiguity	.29**	.29**	.24**	.24**	.28**	.29**
Role-Boundary	.16*	-.20*	.11	-.15	.15	-.20*
Role-Insufficiency	.28**	.28**	.27**	.27**	.30**	.30**
Role-Overload	.16*	.19*	.08	.10	.14	.16*
Role-Responsibility	.03	-.11	-.01	-.07	.01	-.09
Physical Environment	.15	.15	.18*	.18*	.17*	.17*
Composite Pers Desir	.28**	.29**	.23**	.24**	.28**	.29**

Note: n = 162; *p ≤ .05, **p ≤ .01 (two-tail); Original#/Trans# - Original and Transformed Common Study Stressor and Personal Desirability Scales.

For instance, the transformation of the personal desirability Role-Boundary scale increases the correlation with physical strain from 0.16* to an inverse -0.20*; with psychological Strain, from 0.11 to an inverse -0.15; and with the Composite Strain scale, from 0.15 to an inverse -0.20*. Similarly, the correlations between role-overload stres-

sors and strain all change from positive to an inverse -0.32** with physical strain; -0.37** with psychological strain; and -0.36** with composite strain. On the other hand, for example, the transformation of the Role-Boundary Stressor scale has no effect on the correlations with strain.

3.3.4.4.3.2 Personal Desirability Scale: Response Anchor Correlations

Tables 3.3.4.3 to 3.3.4.5 show the correlations for the "Would Like More" "About Right" and "Would Like Less" anchors of the Personal Desirability scale (see Appendix F.1.1.3, Table F.3) with dimensions of strain; and Table 3.3.4.6, correlations between (a) the Composite Personal Desirability scale and (b) the "Like More" "About Right" and "Like Less" Composite Personal Desirability scales with dimensions of hardiness and strain.

"Like More" Correlations

With the exception of the Role-Boundary, Role-Responsibility and Physical Environment scales, correlations between the "Like More" Evaluative Stressor scales and strain are significant (see Table 3.3.4.3). Those with physical strain ranging from 0.16* to a maximum of 0.32** with the Role-Insufficiency scale; those with psychological strain from 0.26** to a maximum of 0.31** with the Role-Insufficiency scale; and those with the composite measure of strain from 0.24** to a maximum of 0.35** with Role-Insufficiency scale (see note Table 3.3.4.3).

Furthermore, correlations between the "Like More" scales are generally significant and range from a minimum of 0.09 (ns) to a maximum of 0.45** between the ambiguity and overload scales. Furthermore, nine of the correlations (i.e., 60%) are less than 0.30** and only one of the 15 ≥ 0.40**. As a result, the scales may be seen as rela-

tively independent in nature. By contrast, the correlations with the Composite Personal Desirability scale are generally moderate in nature and range from a minimum 0.45** to a maximum of 0.76** for the correlation with the Role-Insufficiency scale. That is, the scale carries information which common to each of the desirability scales. Therefore it may be used as a generic replacement for the "Like More" personal desirability scales.

In addition, correlations between the desirability and common stressor scales range tend to be either low or not significant. Those significant, ranging from a minimum of 0.16* to a maximum of 0.47** between the ambiguity scales and a slightly higher 0.51** between the composite scales. As a result, the "Like More" Personal Desirability and Common Study Stressor scales may be seen as relatively independent in nature.

Table 3.3.4.3
Correlations: "Would Like More" Personal Desirability of Stressors With Common Study Stressors and Dimensions of Strain

Scale	1	2	3	4	5	6	7
Personal Desirability							
1. Role-Ambiguity	----						
2. Role-Boundary#	-.26**	----					
3. Role-Insufficiency	.33**	-.25**	----				
4. Role-Overload#	.45**	-.21**	.37**	----			
5. Role-Responsibility#	.14	-.32**	.25**	.23**	----		
6. Physical Environment	.35**	-.16*	.31**	.18*	.09	----	
7. Composite Pers Desir	.73**	-.50**	.76**	.61**	.45**	.56**	----
Common Study Stressor							
8. Role-Ambiguity#	.47**	-.20**	.27**	.15	.01	.16*	.39**
9. Role-Boundary#	.34**	-.17*	.30**	.29**	.04	.07	.37**
10. Role-Insufficiency	.24**	-.04	.29**	.21**	-.05	.00	.25**
11. Role-Overload#	-.39**	.23**	-.22**	-.41**	-.04	-.07	-.35**
12. Role-Responsibility#	.10	-.19*	.25**	.17*	.27**	-.01	.24**
13. Physical Environment	.29**	-.11	.16*	.20**	.03	.23**	.31**
14. Composite Stressor	.48**	-.25**	.40**	.38**	.11	.14	.51**
Strain							
15. Physical	.31**	-.11	.32**	.22**	.16*	.09	.35**
16. Psychological	.26**	-.09	.31**	.26**	.08	.13	.33**
17. Composite Strain	.31**	-.12	.35**	.24**	.14	.12	.37**

Note: n = 162; *p. ≤ .05, **p. ≤ .01 (Two-Tail); (a) # Transformed Scale; (b) The Negative Correlations Reflect the Effect of Data Transformations: The Negative Correlations Should be Read as Positive.

"About Right" Correlations

Although in the main low, and with the exception of those for the Role-Responsibility scale, the correlations between the "About Right" personal desirability scales and strain are all significant (see Table 3.3.4.4) and indicate an inverse relationship with each dimension of strain (see note Table 3.3.4.4). Those with the Physical Strain scale ranging from a minimum of -0.20* to a maximum of -0.33** with the Role-Insufficiency scale; those with the Psychological Strain scale, from a minimum of -0.16* to maximum of -0.31** with the Role-Insufficiency scale; and those with the Composite Strain Scale, from a slightly higher minimum of -0.22** to a maximum of -0.36** with the Role-Insufficiency scale. Furthermore, the inverse correlations between the Personal Desirability scales and strain imply that increases in the appraisal of "About Right" (i.e., satisfaction) with a stressor are related to a reduction in symptoms of strain.

In addition, the correlations between the "About Right" scales are all significant and range from a minimum of 0.16* to a maximum of 0.44** between role-ambiguity and role-overload stressors. Nine of the correlations (i.e., 60.00%) are $\geq$ 0.30** and five (i.e., 33.33%) $\geq$ 0.40** and indicates that redundancy among the variables is in the main low. Therefore, on the basis of this data, the scales may be seen as relatively independent measures of personal desirability and hence valid for use in multiple regression analyses (Tabachnick & Fidell, 1989). Furthermore, correlations with the composite scale are all moderate and range from 0.57** with role-responsibility to a maximum of 0.70** with the desirability of role-boundary stressors. This suggests, (a) that the "About Right" Composite Personal desirability scale is a more general measure of the personal desirability assigned to stressors and (b) may be used to replace the more specific measures of personal desirability in regression analyses.

Table 3.3.4.4
Correlations: "About Right" Personal Desirability of Stressors With Common Study Stressors and Dimensions of Strain

Scale	1	2	3	4	5	6	7
Personal Desirability							
1. Role-Ambiguity	----						
2. Role-Boundary#	-.37**	----					
3. Role-Insufficiency	.25**	-.27**	----				
4. Role-Overload	.44**	-.34**	.28**	----			
5. Role-Responsibility#	-.21**	.39**	-.27**	-.25**	----		
6. Physical Environment	.28**	-.34**	.31**	.19*	-.16*	----	
7. Composite Pers Desir	.68**	-.70**	.62**	.66**	-.57**	.59**	----
Common Study Stressor							
8. Role-Ambiguity#	-.45**	.25**	-.28**	-.26**	.13	-.21**	-.41**
9. Role-Boundary#	-.39**	.31**	-.30**	-.27**	.08	-.15	-.40**
10. Role-Insufficiency	-.22**	.07	-.31**	-.28**	.13	-.17*	-.31**
11. Role-Overload#	.37**	-.21**	.20*	.45**	-.05	.17*	.37**
12. Role-Responsibility#	-.08	.22**	-.24**	-.14	.10	.01	-.19*
13. Physical Environment	-.31**	.21**	-.14	-.24**	.08	-.45**	-.37**
14. Composite Stressor	-.48**	.34**	-.40	-.43**	.17*	-.30**	-.55**
Strain							
15. Physical	-.29**	.23**	-.33**	-.22**	.11	-.20*	-.35**
16. Psychological	-.22**	.16*	-.31**	-.16*	.06	-.23**	-.29**
17. Composite Strain	-.28**	.22**	-.36**	-.21**	.09	-.23**	-.36**

Note: n = 162; *p. ≤ .05, **p. ≤ .01 (Two-Tail); (a) # Transformed Scale; (b) Due to Data Transformations, the Direction of Correlations is Often Reversed: Those Between the Personal Desirability Scales Should be Read as Positive; Those Between the Personal Desirability and Common Study Stressor Scales Read as Negative; and Those With Strain Read as Negative.

Furthermore, the correlations between the personal desirability and common study Stressor scales are generally low or not significant and indicate an inverse relationship between the appraisal of "About Right" (i.e., satisfaction) with stressors and the recognition of common study stressors. The significant correlations range from a minimum of -0.17* to a maximum of -0.45** between both the ambiguity and overload scales and a higher -0.55** between the composite scales. As a result, the "About Right" personal desirability and common study stressor scales may be seen as relatively independent psychometric scales.

"Like Less" Correlations

Correlations between the "Like Less" personal desirability scales and strain are either low or not significant (see Table 3.3.4.5). For example, the Role-Boundary scale correlates a low 0.19* with the Composite Strain scale; Role-Insufficiency -0.17* with the Psychological Strain scale; Physical Environment 0.20* with the Composite Strain scale; and the Composite Personal Desirability scale 0.19* with the Composite Strain scale (see note Table 3.3.4.5). However, with the exception of those for the Composite Personal Desirability scale, the correlations with strain may in effect be somewhat deflated due to the effect of either or both significant skewness and poor reliability among the "Like Less" scales (see Appendix F.1.1.3, Table F.3)

Although mainly low, correlations between the "Like Less" scales are generally significant and range from a low 0.17* to a maximum of 0.39**. Further, of the significant correlations, seven are ≤ 0.30 (i.e., 47.0%) and six ≤ 0.40 (i.e., 40.0%). Therefore, on the basis of this data, the "Like Less" scales may be seen as relatively independent in nature. By contrast, the correlations with the composite scale range from a low 0.31** with the Role-Insufficiency scale to a maximum of 0.75** with the Role-Overload scale. In other words, the composite scale may be seen as essentially a poor representation of the "Like Less" scales and therefore should not be used as a more general measure of personal desirability.

With the exception of those between the Role-Overload scales, the correlations between the "Like Less" personal desirability and common study stressor scales are mainly not significant. The significant correlations range from a minimum of 0.16* to a maximum of 0.45** between the Physical Environment scales and a slightly lower

0.37** between the composite scales. Consequently, the "Like Less" personal desirability and common study stressor scales may be seen as relatively independent domains of measurement.

Table 3.3.4.5
Correlations: "Would Like Less" Personal Desirability of Stressors With Common Study Stressors and Dimensions of Strain

Scale	1	2	3	4	5	6	7
Personal Desirability							
1. Role-Ambiguity#	----						
2. Role-Boundary#	-.24**	----					
3. Role-Insufficiency#	.28**	-.17*	----				
4. Role-Overload#	-.39**	.34**	-.29**	----			
5. Role-Responsibility#	.33**	-.37**	.30**	-.28**	----		
6. Physical Environment#	-.14	.30**	-.06	.23**	-.22**	----	
7. Composite Pers Desir#	-.50**	.67**	-.31**	.75**	-.62**	.60**	----
Common Study Stressor							
8. Role-Ambiguity#	-.02	.17*	.04	.21**	-.17*	.11	.25**
9. Role-Boundary#	-.12	.27**	-.04	.17*	-.05	.16*	.24**
10. Role-Insufficiency	-.09	.03	-.09	.22**	-.17*	.16*	.22**
11. Role-Overload#	.06	-.08	-.05	-.35**	.04	-.20*	-.29**
12. Role-Responsibility#	-.02	.14	.11	.06	.09	.03	.06
13. Physical Environment	-.09	.19*	.07	.18*	-.13	.45**	.33**
14. Composite Stressor	-.11	.25**	.03	.31**	-.13	.29**	.37**
Strain							
15. Physical	-.08	.20*	.12	.15	-.06	.18*	.21**
16. Psychological	-.04	.13	.17*	.04	-.05	.20*	.14
17. Composite Strain	-.06	.19*	.14	.12	-.05	.20*	.19*

Note: n = 162; *p. ≤ .05, **p. ≤ .01 (Two-Tail); (a) # Transformed Scale; (b) Due to Data Transformations, the Direction of Correlations is Often Reversed: Those Between the Personal Desirability Scales Should be Read as Positive; Significant Negative Correlations Between the Personal Desirability and Common Study Stressor Scales Read as Positive; the Correlations Between the Role-Insufficiency Scale and Strain Read as Negative.

3.3.4.4.3.3 Personal Desirability Composite Scales With Hardiness and Strain

Correlations between the composite personal desirability scales and strain are mainly significant and tend to be low in magnitude (see Table 3.3.4.6). Those with the Physical Strain scale range from 0.21** to -0.35**; those with Psychological Strain from 0.14 (ns) to a maximum of 0.33**; and those with the Composite Strain scale from 0.19* to a

maximum of 0.37** with the "Like More" Personal Desirability scale. In addition, correlations with the hardiness scales are either not significant or weak. In particular, those with the hardiness Challenge scale are all not significant. Those significant range from a minimum of -0.17* between the "Like More" Composite scale and the Commitment hardiness scale to a maximum of -0.35** between the "Like Less" Composite scale and the Commitment hardiness scale.

Table 3.3.4.6
Correlations: Composite Personal Desirability Scales With Hardiness and Dimensions of Strain

Scale	1	2	3	4
Composite Desirability				
1. Personal Desirability#	----			
2. Would Like More	0.80**	----		
3. Would Like Less#	0.74**	0.27**	----	
4. About Right	-0.95**	-0.79**	-0.75**	----
Hardiness				
5. Control	-0.18*	-0.14	-0.24**	0.23**
6. Commitment	-0.26**	-0.17*	-0.35**	0.32**
7. Challenge	0.04	-0.02	0.00	0.02
8. Hardiness	-0.18*	-0.15	-0.26**	0.25**
Strain				
5. Physical	0.29**	0.35**	0.21**	-0.35**
6. Psychological	0.24**	0.33**	0.14	-0.29**
7. Composite Strain	0.29**	0.37**	0.19*	-0.36**

Note: n = 162; *p. ≤ .05, **p. ≤ .01 (Two-Tail); # Transformed Scale;.

Correlations between the composite personal desirability scales, however, range from low to essentially multicollinear in nature. In particular, the correlation between the Composite Personal Desirability and Composite "About Right" scales (i.e., 0.95**) approach singularity and suggests that both scales carry identical information. In addition, the high correlations between the Composite Personal Desirability and "Like More" (i.e., 0.80**) and "Like Less" (i.e., 0.74**) scales; and likewise those between the Composite "About Right" and "Like More" (i.e., -0.79**) and "Like Less" (i.e.,

-0.75**) scales indicates that either of the correlated scales is in effect redundant. By contrast, the low 0.27** correlation between the Composite "Like More" and "Like Less" scales indicates that these scales are relatively independent measures of personal desirability.

In sum, due to (a) the evidence of redundancy between scales and (b) the circularity of the scales, none of the composite scales should not be used as predictors of strain as the divergent validity of the scales is seemingly poor. Therefore, on the basis of these correlations, the composite scales do not reflect relatively discrete dimensions of personal desirability.

3.3.4.4.4 Regression Analyses

Tables 3.3.4.7 to 3.3.4.13 summarise the results from a series of backward and hierarchical modelling regression models which (a) explore the relative effect of common study stressors (i.e., recognition of common stressors), personal desirability and dispositions for hardiness on dimensions of strain; (b) identify the models of best fit for physical, psychological and composite symptoms of strain; (c) test the theoretical importance and identify the incremental effect of personal desirability when placed in the presence of significant hardiness and common study stressor predictors of strain.

Table 3.3.4.7 present a summary of the results from baseline regression models which explored the effect of (a) common study stressors; (b) the personal desirability assigned to common study stressors and (c) dispositions for hardiness on composite symptoms of strain (results for physical and psychological strain are shown in Appendix F.2.1, Tables F.4 & F.5). Table 3.3.4.8, the results from a series of model building analyses which explored the relative effect of significant personal desirability scales when in the presence of significant common study stressors on dimensions of strain; Table 3.3.4.9, the results from a series of backward regression models which sought to identify (a) the relative

effect of significant hardiness scales in the model; and (b) the model of best fit (i.e., most parsimonious explanation for the symptoms of strain reported by the sample) from the relative effect of significant predictors of strain. Table 3.3.4.10, the results from hierarchical modelling which sought to test (a) the theoretical importance and (b) identify the incremental effect of personal desirability on the explained variance of composite stain when placed in the presence of significant hardiness and common study stressor predictors of strain; and Tables 3.3.4.11 a summary of the results from a series of regression analyses which explore the relative effect of personal desirability in terms of "Like More" "About Right" and "Like Less" on symptoms of composite strain (results for physical and psychological strain are shown in Appendix F.1.2.2, Tables F.6 & F.7).

For each regression model, an alpha pout at ≥ .051 (Two Tailed) is used to (a) effect the removal of a variable from the regression model or (b) interpret the data in the equations for hierarchical models.

3.3.4.4.4.1 Baseline Analyses

From the results for the baseline models (see Table 3.3.4.7), the recognition of common study stressors, the personal desirability assigned to common study stressors and dispositions for hardiness each account for a significant percentage of the explained variance in Composite symptoms of strain. The cumulative effect of role-boundary, role-ambiguity and role-overload common study stressors explains 23.39% (21.94% adj) of the variance in composite strain; the personal desirability of role-insufficiency stressors, a much lower 07.01% (6.43% adj) of the variance in composite strain; and the cumulative effect of commitment, control and challenge dispositions for hardiness, a substantially higher 34.05% (32.79% adj) of the variance in composite strain.

Table 3.3.4.7
Backward Regression: Baseline Models - Composite Strain on Common Study Stressor, Personal Desirability of Stressors and Dispositions for Hardiness

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Common Study Stressors	Role-Boundary#			0.2331	3.024	.0029
	Role-Ambiguity#	23.39%	21.94%	0.2141	2.929	.0039
	Role-Overload#			-0.2130	-2.758	.0065
Mult R=.4836; SE 18.8551; F(3,158) 160803; p .0000						
Personal Desirability	Role-Insufficiency#	07.01%	06.43%	0.2647	3.472	.0007
Mult R=.2647; SE 9.8515; F(1,160) 12.0565; p .0007						
Hardiness	Commitment			-0.2642	-3.081	.0024
	Control	34.05%	32.79%	-0.2770	-3.017	.0030
	Challenge			-0.2052	-2.901	.0042
Mult R=.5835; SE 17.4947; F(3,158) 27.1875; p .0000						

Note: pout ≥ .051 (two-tail); #Transformed Scale

Further, when the variance explained by the respective models is seen in relative terms, the effect of role-boundary, role-ambiguity and role-overload common study stressors explains an extra 15.51% (adj) of the variance in composite strain beyond the 6.43% (adj) explained by the personal desirability of role-insufficiency stressors; and the effect of hardiness cognitive styles on the explained variance, an additional 10.85% (adj) beyond the 21.94% (adj) explained by common study stressors. In other words, when compared to the variance explained by common study stressors and the personal desirability of stressors, dispositions for hardiness explain substantially more of the variability in composite (i.e., physical & psychological) symptoms of strain.

3.3.4.4.4.2 Model Building Analyses

The modeling building analyses sought to explore the relative effect (i.e., when in the presence of each other) of significant personal desirability and common study stressor predictors of strain on the explained variance in physical, psychological and composite

symptoms of strain. As Table 3.3.4.8 shows, the relative effect of common study stressors and the personal desirability of common study stressors explained an increased 20.60% (18.58%) of the variance in physical symptoms of strain; 20.21% (18.70% adj) of the variance in psychological symptoms of strain; and higher 25.49% (23.59% adj) of the variance in composite strain. That is, they show that that the personal desirability assigned to role-insufficiency stressors accounts for variance in symptom of strain beyond that explained by common study stressors. Specifically, when the results are compared with those for the common study stressor baseline models, the relative effect of the personal desirability assigned to role-insufficiency stressors explains an additional 1.48% (adj) of the variance in physical strain; a slightly higher1.63% (adj) of the variance in psychological strain; and 1.65% (adj) of the variance in composite strain.

Table 3.3.4.8
Backward Regression: Dimensions of Strain on Significant Common Study Stressor and Personal Desirability Predictors of Strain

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Physical Strain	Role-Ambiguity#	20.60%	18.58%	0.1824	2.406	.0173
	Role-Overload#			-0.1731	-2.188	.0301
	Role-Overload#			0.1649	2.052	.0418
	Des. Role-Insufficiency#			0.1494	1.967	.0510
Mult R=.4539; SE 14.7203; F(4,157) 10.1825; p .0000						
Psychological Strain	Role-Overload#	20.21%	18.70%	-0.2552	-3.271	.0013
	Role-Boundary#			0.1976	2.480	.0142
	Des. Role-Insufficiency#			0.1529	2.046	.0424
Mult R=.4496; SE 9.1827; F(3,158) 13.3435; p .0000						
Composite Strain	Role-Overload#	25.49%	23.59%	-0.2002	-2.612	.0099
	Role-Boundary#			0.2000	2.569	.0111
	Role-Ambiguity#			0.1872	2.548	.0118
	Des. Role-Insufficiency#			0.1546	2.101	.0372
Mult R=.5048; SE 18.6545; F(4,157) 13.4250; p .0000						

Note: pout ≥ .051 (two-tail); #Transformed Scale; Des. - Desirability

3.3.4.4.4.3 Models of Best Fit

The models of best fit sought to (a) explore the relative effect of significant dispositions for hardiness when in the presence of significant common study stressor and personal desirability predictors of strain on the explanation of strain; and (b) identify the model of "best fit" from the significant predictors of strain. That is, they sought to identify the most parsimonious explanation for the variability in symptoms of physical, psychological and composite strain reported by the participants in the study.

As Table 3.3.4.9 indicates, the relative effect of dispositions for hardiness adds useful information to the explained variance beyond that explained by common study stressors and appraisals of the personal desirability of common study stressors. Specifically, when compared to the results for the model building analyses (see Table 3.3.4.8), the relative effect of dispositions for control and challenge explain an additional 16.37% (adj) of the variance in physical symptoms of strain; an increased 18.0% (adj) of the variance in psychological symptoms of strain; and a lower 16.93% (adj) of the variance in composite symptoms of strain.

Furthermore, with regard to the models of best fit, the relative effect of dispositions for control and challenge, the recognition of common role-boundary stressors and the personal desirability assigned to role-insufficiency stressors each account for a significant percentage of the variance in symptoms of strain reported by the participants in the study. Together they explain 34.95% (33.29% adj) of the variance in physical symptoms of strain; an increased 38.56% (36.70% adj) of the variance in psychological symptoms of strain; and a higher 41.99% (40.52%) of the variance in composite symptoms of strain.[3]

---

[3] Note: When the dispositional scales are replaced with the Hardiness scale in the models of best fit, the Physical Strain model explains 34.27% (33.02% adj) of the variance; the Psychological Strain, model 38.40% (37.23% adj) of the variance; and Composite Strain model, 42.48% (41.40% adj) of the variance.

Table 3.3.4.9
Backward Regression: Model of Best Fit - Dimensions of Strain on Significant Common Study Stressor, Personal Desirability and Hardiness Predictors of Strain

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Physical Strain	Hard Control	34.95%	33.29%	-0.4148	-6.138	.0000
	Des. Role-Insufficiency#			0.2071	3.078	.0025
	Role-Boundary#			0.1678	2.444	.0157
	Hard Challenge			-0.1338	-2.019	.0452
Mult R=.5911; SE 13.3243; F(4,157) 21.0834; p .0000						
Psychological Strain	Hard Control	38.56%	36.70%	-0.3200	-4.874	.0000
	Hard Challenge			-03097	-4.807	.0000
	Role-Boundary#			0.2012	3.015	.0030
	Des. Role-Insufficiency#			0.1867	2.855	.0049
Mult R=.6210; SE 8.0837; F(4,157) 24.6341; p .0000						
Composite Strain	Hard Control	41.99%	40.52%	-0.4061	-6.365	.0000
	Des. Role-Insufficiency#			0.2174	3.421	.0008
	Hard Challenge			-0.2113	-3.375	.0009
	Role-Boundary			0.2096	3.232	.0015
Mult R=.6480; SE 16.4592; F(4,157) 28.4138; p .0000						

Note: pout ≥ .051 (two-tail); #Transformed Scale; Des. - Desirability

Therefore, given the commonality across the models (i.e., the predictors of strain are common across the models), the composite strain model is in effect the model of best fit as it explains the highest percentage of the variance in strain. In addition, there is support for the hypothesis (H1a) that the personal desirability of common study stressors will explain a significant percentage of the variance in symptoms of strain when in the presence of common study stressors and dispositions for hardiness.

3.3.4.4.4.4 Hypothesis Testing

Hierarchical modelling was used to test (a) the theoretical importance of personal desirability in the transactional model of stress; and (b) the hypothesis (H1b) that the incremental effect of the personal desirability of common study stressors would add useful

information to the cumulative variance in composite strain when placed in the presence of significant common study stressors and dispositions for hardiness.

As the results in Table 3.3.4.10 show, the incremental effect of the personal desirability assigned to role-insufficiency common study stressors adds useful information to the cumulative variance in composite strain. It adds a low 4.33% (4.04% adj) to the 30.53% (29.66% adj) explained by control and challenge dispositions for hardiness and the 7.14 (6.82% adj) explained by role-boundary common study stressors.[4] That is, having "partialled out" or partioned the variance common to the cognitive processes underlying (a) the appraisal of dispositional tendencies and (b) the recognition of common study stressors, the incremental effect of personal desirability appraisal processes adds a significant 4.33% (4.04% adj) to the cumulative variance in composite symptoms of strain. Further, if the incremental variance explained by common stressor and personal desirability cognitive processes is compared in proportional terms, on average across the models (see footnote 5), the incremental effect of common study stressors (i.e., 6.82% adj) accounts for 61.8% more of the variance in strain than the personal desirability (i.e., 4.04% adj) of common study stressors.

Therefore, given this result, there is support for the theoretical importance or the significance of personal desirability in the transactional view of stress. That is, it highlights the importance of personal desirability appraisal processes in the mental summation of the imbalance between actual (i.e., recognition of stressors) and ideal (i.e., desir-

[4] When related to Physical Strain, the incremental effect of Role-Boundary stressors adds 4.986% (4.607% adj) to the explained variance and the desirability of Role-Insufficiency stressors, 3.926% (3.577% adj) to the explained variance. Similarly, when related to Psychological Strain, The incremental effect of Role-Boundary stressors adds an increased 6.258% (5.923% adj) to the explained variance and the desirability of Role-Insufficiency stressors, 3.189% (2.850% adj) to the explained variance.

ability of stressors) stressors and the translation of stress to symptoms of strain. In addition, there is support for the hypothesis (H1b) that the personal desirability of common study stressors would add significant information to the cumulative variance when placed in the presence of significant dispositions for hardiness and common study stressors.

Table 3.3.4.10
Hierarchical Regression: Composite Strain on Significant Hardiness, Common Study Stressor and Personal Desirability Predictors of Strain

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
	Step 1								
	Control	30.53%	29.66%	30.53%	.0000	-0.4606	-2.075 - -1.138	-6.769	.0000
Hardiness	Challenge					-0.2149	-1.197 - -0.276	-3.158	.0019
Mult R=.5526; SE 17.8982; F(2,159) 34.9420, p .0000									
	Step 2								
Study Stressors	Role-Boundary#	37.67%	36.48%	07.14%	.0000	0.2731	4.575 - 12.509	4.253	.0000
Mult R=.6137; SE 17.0077; F(3,158) 31.8266, p .0000									
	Step 3								
Desirability	Role-Insuffic#	41.99%	40.52%	04.33%	.0008	0.2174	4.905 - 18.304	3.421	.0008
Mult R=.6480; SE 16.4592; F(4,157) 28.4138, p .0000									

Note: pout, ≥ .05; # Transformed Variable

3.3.4.4.4.5 "Like More" "About Right" and "Like Less" Response Anchor Analyses

These analyses sought to unpack the nature and effect of the personal desirability assigned to common study stressors. As Table 3.3.4.11 shows, the appraisal of common study stressors in terms of "like More" (i.e., desirable) "About Right" (i.e., congruence) and "Like Less" (i.e., undesirable) each explain a significant percentage of the explained variance in composite strain (results for physical and psychological strain are shown in Appendix F.1.1.2, Tables F.6 & F.7) .

Table 3.3.4.11
Backward Regression: Composite Strain on Personal Desirability for "Like More" "About Right" and "Like Less" of Common Study Stressors

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
"Like More"	Role-Insufficiency	16.48%	15.43%	0.2737	3.570	.0005
	Role-Ambiguity			0.2237	2.918	.0040
Mult R=.4060; SE 19.6252; F(2,159) 15.6865, p. 0000						
"About Right"	Role-Insufficiency	16.87%	15.82%	-0.3111	-4.166	.0001
	Role-Ambiguity			-0.2015	-2.699	.0077
Mult R=.4107; SE 19.5794; F(2,159) 16.1326, p. 0000						
"Like Less"##	Physical Environment#	03.95%	03.35%	0.1987	2.565	.0112
Mult R=.1987; SE 20.9801; F(1,160) 6.5780, p. 0112						

Note: pout, ≥ .051; # Transformed Variable; "Like Less"## - Ambiguity and Insufficiency Scales Removed From Model (See Appendix F.1.1.2, F.1.1.3, Tables F.2 & F.3).

As the results indicate, when common study stressors are appraised in terms of "Like More" of the stressor, the personal desire for more role-insufficiency and role-ambiguity stressors explains a moderate 16.48% (15.43% adj) of the variance in composite strain. Conversely, when common study stressors are appraised in terms of "Like Less" of the stressor, the personal desire for less physical environment stressors explains a significant but substantially lower 3.95% (3.35% adj) of the variance in symptoms of composite strain. By contrast, when common study stressors are appraised as "About Right" for the person, the personal satisfaction with role-insufficiency and role-ambiguity stressors explains a moderate 16.87% (15.82% adj) of the variance in composite strain.

Summary of Results

Taken together, these results indicate that the relationship between the personal desirability of common study stressors in terms of "Like More" "About Right" and "Like Less" and strain is relatively consistent across the dimensions of strain. Furthermore, due to the commonality of the predictors across the "Like More" and "About Right"

models, there is evidence of an overlap in the appraisal of "like More" and "About Right" with stressors. This suggests that (a) these dimensions of appraisal may in effect reduce to a common dimension of person desirability (i.e., personal underload), or alternatively (b) that more discrete scores for "Like More" and "About Right" with a stressor (i.e., the use of scores greater than zero) are required to discriminate the personal desirability assigned to stressors. However, although the results suggest an overlap in the appraisal of common study stressors, the Beta coefficients for the "Like More" and "About Right" models are reversed. This suggests that (a) these domains of appraisal are relatively discrete and (b) have unique or direct relationships with symptoms of strain.

Nonetheless, on the basis of these results, there is support for the hypothesis (H2) that the appraisal (i.e., personal desirability assigned to stressors) of common study stressors in terms of (a) desirable, (b) undesirable and (c) congruence (i.e., balance) would each explain a significant percentage of the variability in symptoms of strain.

3.3.4.4.5 The Correspondence Between the Personal Desirability of Common Stressors and Dimensions of Strain

Since the "Like More" "About Right" and "Like Less" appraisals of personal desirability each explain a significant percentage of the variance in strain, it is likely that the corresponding mean strain scores for physical, psychological and composite strain will vary in sympathy with the meaning assigned to the stressor (see results study five). Therefore, based on the transactional tenet that the appraisal of an imbalance with a stressor (i.e., "Like More" or "Like Less" of the stressor) may subsequently reflect in symptoms of strain, it is reasonable to hypothesise that the corresponding mean scores for strain will be significantly higher than the corresponding "About Right" mean scores for

strain. Furthermore, it is likely that increases in the magnitude of the appraised imbalance between actual and ideal demands (i.e., increases in "Like More or "Like Less" of the stressor) will correspond to an increase in symptoms of strain. On the other hand, for increases in the personal satisfaction (i.e., "About Right") assigned to a stressor, it is reasonable to postulate that increases in the personal satisfaction with work stressors will reflect as a reduction in symptoms of strain.

Table 3.3.4.12 shows the correspondence between increases in the scores for the Composite Personal Desirability and Role-Boundary Personal Desirability scales, and the mean scores for physical, psychological and composite strain; and Table 3.3.4.13, the results from correlated samples T Tests which compared the mean scores for strain corresponding to increases in the magnitude of the scores for the "Like More" "About Right" and "Like Less" Composite Personal Desirability and Role-Boundary Personal Desirability scales (results for physical and psychological strain are shown in Appendix F.1.3, Tables F.8 & F.9).[5]

In addition, Figures 4.4.1 and 4.4.2 illustrate the correspondence between increases in the scores for (a) the Composite Personal Desirability scale and (b) Role-Boundary Personal Desirability scale and the mean scores for composite strain (graphical data for Physical and Psychological Strain is shown in Appendix F.1.3, Figures F.1 to F.4).

The results in Table 3.3.4.12 indicate that increases in the magnitude of the response to the "Like More" "About Right" and "Like Less" Composite Personal Desirability and Role-Boundary Personal Desirability scales correspond to changes in the magnitude of composite strain. Those corresponding to the "Like More" and "Like Less" scales

[5] Note: Although not a significant predictor of strain, the Role-Boundary Personal Desirability scale was chosen as the basis for the comparisons of mean strain scores as it had the more normal distribution of responses to the "Like More" "Like Less" and "About Right" response options of the scale (see Appendix F.1.1.2, Table F.2).

reflecting an increase in symptoms of strain; and those for the "About Right" scale, to a decrease in strain related outcomes. For instance, the composite strain mean scores corresponding to the "Like More" scale of the Composite Personal Desirability Scale increase from 92.667 for the Baseline sample to a maximum of 107.40 for the 2 SD sample. Conversely, those corresponding to the "About Right" scale, reflect a substantial decrease from a high of 90.307 to a minimum of 73.00 for the 2 SD sample.

Furthermore, the table indicates that there are consistent and likely significant differences between the mean strain scores for each of the samples. As the data indicates, increases in the magnitude of the appraised imbalance (balance) with a stressor corresponds to noticeable differences between the strain mean scores for each sample. For example, when related to the Composite Personal Desirability scale and a sample size $\geq$ 30, the mean scores for psychological strain corresponding to "Like More" and "Like Less" (i.e., 38.839 & 36.152) are significantly higher than the "About Right" mean score (i.e., 28.212). In other words, albeit implicit, the data indicates that the nature of the transactional relationship with a stressor (i.e., the appraised imbalance or desirability of stressors) subsequently reflects in the direction of strain related outcomes.

Figures 4.4.1 and 4.4.2 further illustrate the linkage between the appraisal of common study stressors and symptoms of strain. As the graphs show, increases in the scores for "Like More" and "Like Less" of common study stressors, generally correspond to higher levels of physical, psychological and composite strain. Conversely, increases in scores for "About Right" with common study stressors (i.e., increases in personal satisfaction), correspond to a noticeable decline in symptoms of strain. Thus, based on the scope of this data, there is descriptive support for the hypothesis (H3) that increases in the appraisal of a common study stressor as either more desirable or more undesirable

Table 3.3.4.12
Personal Desirability Scales: Comparison of Physical, Psychological and Composite Strain Mean Scores Corresponding to "Like More" "Like Less" and "About Right" Response Anchors

Evaluative Scale	Select If+	Cases Selected	Mean Eval Scale	Mean Phys Strain#	Mean Psyc Strain#	Mean Comp Strain#
Composite Personal Desirability Scale: Mean Score Differences						
Baseline Mean scores: Match "Like Less" Sample Size						
Desirability						
Like More	GT 4	150	19.207	68.520	35.493	92.667
About Right	GT 27	153	55.373	66.699	34.686	90.307
Like Less	GT 0	152	10.592	67.789	35.046	91.658
Sample Size ≈ 1SD From Scale Mean						
Desirability						
Like More	GT 18	75	25.893	72.187	37.333	97.360
About Right	GT 54	74	67.176	62.581	32.676	85.243
Like Less	GT 8	77	16.338	70.623	36.519	95.390
Sample Size ≥ 30						
Desirability						
Like More	GT 25	31	31.194	74.258	38.839	100.710
About Right	GT 66	33	75.455	57.848	28.212	77.000
Like Less	GT 15	33	21.818	70.818	36.152	95.000
Sample Size ≈ 2SD From Scale Mean						
Desirability						
Like More	GT 34	10	37.200	79.200	41.800	107.400
About Right	GT 78	6	84.500	53.500	28.000	73.000
Like Less	GT 23	9	31.333	66.778	31.556	87.667
Role Boundary Stressor: Mean Score Differences						
Baseline Mean Scores: Scale Mean Scores						
Desirability						
Like More	ALL	162	1.302	67.420	34.870	91.160
About Right	ALL	162	10.407	67.420	34.870	91.160
Like Less	ALL	162	2.105	67.420	34.870	91.160
Evaluative Score GT Zero						
Desirability						
Like More	GT 0	74	2.851	69.297	35.865	93.811
About Right	GT 6	124	12.169	66.613	34.468	90.056
Like Less	GT 0	92	3.707	70.652	36.272	95.217
Evaluative Score ≥Two						
Desirability						
Like More	GT 2	26	4.423	70.154	35.962	94.654
About Right	GT 9	88	13.466	65.466	33.977	88.602
Like Less	GT 2	47	5.340	69.191	35.830	93.660
Evaluative Score ≥ 4						
Desirability						
Like More	GT 4	9	6.111	67.667	37.444	92.667
About Right	GT 12	43	15.00	60.116	31.907	82.209
Like Less	GT 6	8	9.375	75.500	36.375	99.000

Note: n = 162; Select If+ - Cases Selected Using the Scores from the Respective Composite Personal Desirability and Role-Boundary Personal Desirability Scales (see Appendix F.1.1.3, Table F.3); Phys Strain# - Physical Strain, Psyc Strain# - Psychological Strain, Comp Strain# - Composite Strain.

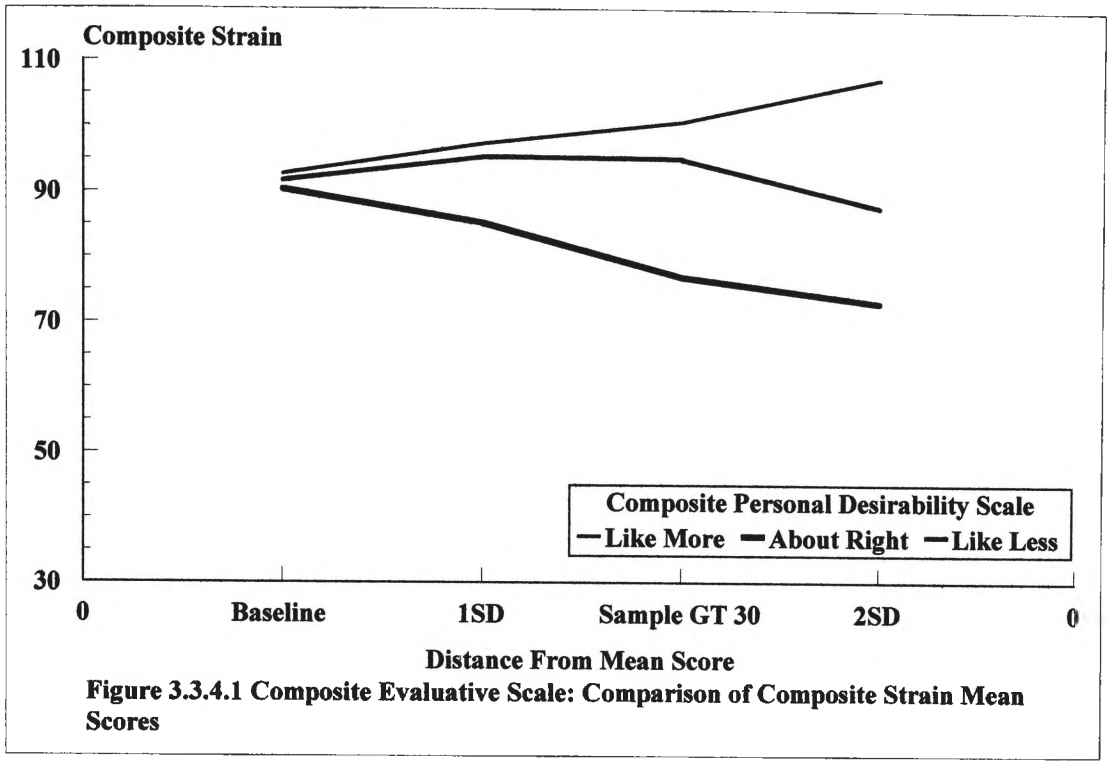


Figure 3.3.4.1 Composite Evaluative Scale: Comparison of Composite Strain Mean Scores

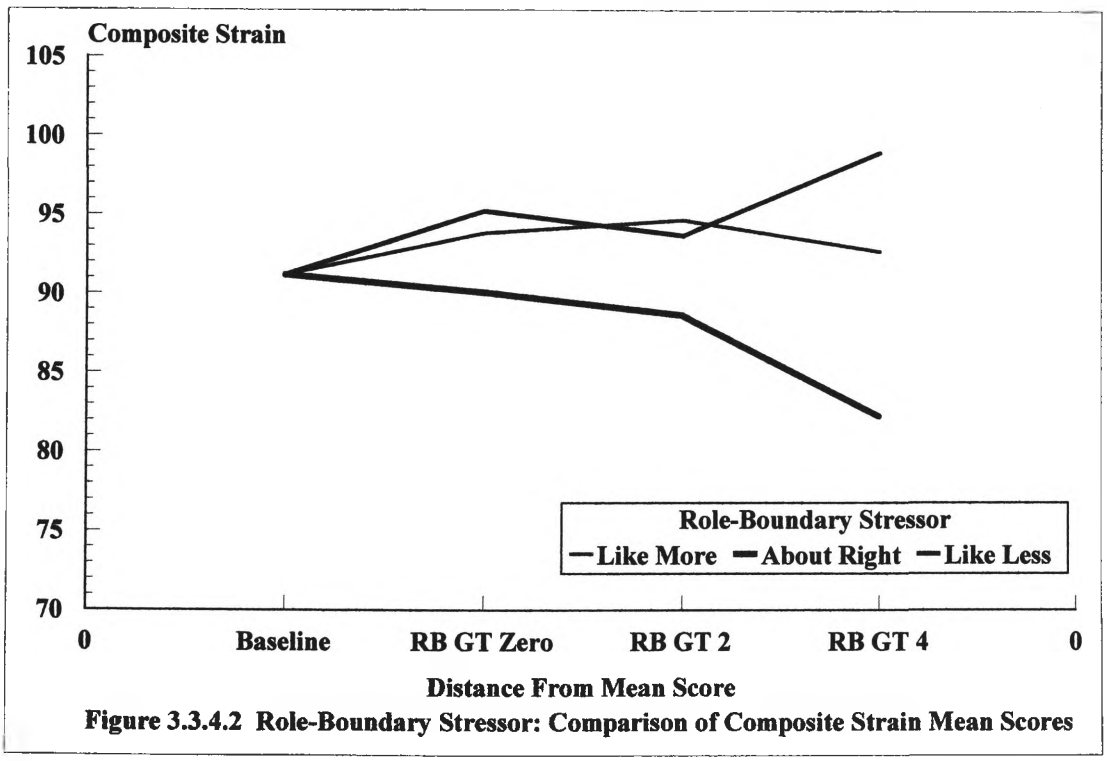


Figure 3.3.4.2 Role-Boundary Stressor: Comparison of Composite Strain Mean Scores

corresponds to an increase in symptoms of strain; and increases in the appraisal of congruence (i.e., satisfaction) with common study stressors, to a decrease in symptoms of strain.

Table 3.3.4.13 shows the results from correlated T Tests which tested the significance of the mean differences between composite strain mean scores corresponding to the "Like More" "About Right" and "Like Less" scales.[6] As the results show, from the mean scores related to the Composite Personal Desirability Scale, significant differences exist between the composite strain mean scores corresponding to (a) "Like More" and "About Right" and (b) "Like less" and "About Right" Personal Desirability scales (results for physical and psychological strain are shown in Appendix F.1.3, Tables F.8 and F.9).[7]

With respect to the relationship between composite strain mean scores and the personal desirability of role-boundary stressors, significant differences between the corresponding mean strain scores are confined to the mean strain scores corresponding to "Like Less" and "About Right" with role-boundary stressors. Conversely, although significant at the ≤ 0.05 level of significance, following correction for "familywise" errors, the difference between the composite strain mean scores corresponding to the Role-Boundary "Like More" and "About Right" scales are in effect not significant.

Therefore, on the basis of these results, there is support for the hypothesis (H4) that strain mean scores corresponding to either desirable or undesirable common study stressors will be significantly higher than strain mean scores corresponding to congruence or personal satisfaction with common study stressors.

---

[6] See Footnote E3, Appendix E.4.5 re discussion on the comparison of correlated samples with missing values. See also Howell, 1992, p. 177.

[7] Note: Due to multiple comparisons (6) and thereby familywise errors, the Significance of T* for each T Test is adjusted from $\alpha = 0.05$ to 0.008 (i.e., $\alpha' = 0.05/6$).

Table 3.3.4.13
Statistical Comparison of Composite Strain Mean Scores Corresponding to "Like More" "Like Less" and "About Right" Evaluative Scores

Evaluative Scale	No Cases Retained	Missing Values	Random Sample	Scale Mean	SE of Mean Diff	T	Signif T*
Composite Personal Desirability Scale							
Sample Size ≈ 1SD From Scale Mean							
Like More	162	87	76	97.3476	1.959	-5.88	.000
About Right	162	88	76	85.8302	----	----	----
Like Less	162	85	76	95.4075	1.796	-5.33	.000
About Right	162	88	76	85.8302	----	----	----
Sample Size ≥ 30							
Like More	85	54	31	100.3211	3.345	-7.55	.000
About Right	85	52	31	75.0801	----	----	----
Like Less	85	52	31	95.8068	3.322	-6.24	.000
About Right	85	52	31	75.0801	----	----	----
Role-Boundary Stressor							
Role-Boundary Score GT Zero							
Like More	162	88	77	94.7447	2.436	-2.45	.017
About Right	162	38	77	88.7843	----	----	----
Like Less	162	70	77	97.3881	2.168	-3.97	.000
About Right	162	38	77	88.7843	----	----	----
Role-Boundary Score GT 2							
Like More	151	125	36	98.4397	4.337	-2.73	.010
About Right	151	63	36	86.6183	----	----	----
Like Less	151	104	36	97.7360	3.913	-2.84	.007
About Right	151	63	36	86.6183	----	----	----

Note: For Each Block of Comparisons (i.e., Each Random Sample), Required α for Signif T* adjusted from 0.05 to 0.008 (i.e., $\alpha/c = 0.05/6 = 0.008$).

3.3.4.5 Discussion

The findings of the present study show that the personal desirability of common study stressors contributes significant information to the explained variance in strain. That is, they illustrate that people view the personal imbalance (i.e., transactional relationship) with a common study stressor as a source of personal stress. Therefore, when taken together, the findings demonstrate that a "cognitive imbalance" or "value discrepancy" approach to the measurement of stressors (a) significantly improves the understanding

of the stressor to strain relationship and (b) shows the versatility and applied utility of an evaluative or imbalance approach to the measurement of stressors.

The personal desirability of stressors was found to contribute significant information to the explained variance in strain beyond that explained by (a) common study stressors and (b) dispositions for hardiness. As a result, the findings demonstrate the logical importance and relative significance of appraisals of personal desirability in the transactional relationship underlying symptoms of strain. Further, when the results are seen in cognitive terms, they indicate that the recognition and desirability of stressors and those for self-evaluations of hardiness may be seen as relatively independent cognitive processes underlying the transactional relationship between stressors and strain. In addition, they indicate that the more general appraisal processes related to personal desirability and personal hardiness each contribute significant information to the explained variance in symptoms in strain.

Furthermore, the results indicate that individual differences may be seen to underpin or discriminate the personal desirability of common study stressors and their relationship with strain. When the personal meaning of stressors (i.e., the appraised imbalance (balance) with stressors) is distinguished in terms of "Like More" "Like Less" and "About Right", each accounts for a significant percentage of the variance in strain. In addition, for given increases in the magnitude of an appraised imbalance (balance) with a stressor, the correspondence with the magnitude of strain discriminates the direction of the linkage between the nature of appraisals and symptoms of strain. Those corresponding to an increasing imbalance with stressors (i.e., "Like More" & "Like Less") to an increase in symptoms of strain; and those corresponding to an increase in the personal satisfaction (i.e., "About Right") with stressors, to a reduction in symptoms of strain.

Finally, correlations with hardiness and hierarchical regression analyses suggest the existence of a linkage or functional relationship between dispositions for hardiness and the role of both perception (i.e., recognition of stressors) and appraisal (i.e., personal desirability of stressors) in the stressor to strain process. That is, taken together, they suggest that dispositions for hardiness may in effect act to either nullify (i.e., mediate) or increase (i.e., moderate) the role of personal desirability in symptoms of strain.

Although rather small, when considered in the presence of significant common study stressors, the personal desirability of role-insufficiency common study stressors were found to account for a significant percentage of the variance in strain explained by the respective models. Similarly, for the models of best fit, when in the presence of significant common study stressors and dispositions for hardiness, the desirability of role-insufficiency stressors was found to contribute significant information to the variance in strain explained by the model. As a result, there was support for the hypothesis (H1a) that appraisals of personal desirability would add significant information to the explained variance when in the presence of common study stressors and dispositions for hardiness. Further, when seen in terms of the slippage between theory and method, they show that it is indeed possible to "personalise" the measurement and explanation of stress by including evaluative measures of the personal desirability of stressors in the presence of recognition (i.e., descriptive) and dispositional cognitive processes (Payne et al., 1988). Furthermore, when seen in transactional terms, they illustrate the relative importance and significance of the personal desirability assigned to stressors in the transactional process underlying strain related outcomes.

Models of best fit identify the relative importance of variables in the model and the power of a significant model to explain strain. Hierarchical models, on the other hand, are more concerned with the theoretical importance and cumulative effect of variables

added to a model; that is, they are concerned with the significance and unique effect of variables sequentially added to a model. In essence, then, the underlying concern is the heuristic (i.e., conceptual importance) or alternatively, the applied utility of the variable; the question for research, "how much" additional variance does the variable explain when placed in the model (see Chapter 2: Sections 2.1.2, 2.3.5 and Figure 2.1.1).

For example, in this study, the results from hierarchical modelling illustrate (a) the theoretical importance of the personal desirability of stressors in the conceptual model and (b) the unique effect of appraisals concerned with the personal desirability of common study stressors when placed in the model. Thus, when the results are seen in terms of utility, they suggest that the incremental or unique effect of the personal desirability of stressors in the model has both heuristic and applied utility in the measurement and explanation of the transactional process underlying stressor to strain relationships. As the results show, when placed in the presence of dispositions for hardiness (i.e., control and challenge) and the recognition of role-boundary stressors, the incremental effect of the personal desirability of role-insufficiency common study stressors adds 4.33% (4.04% adj) to the explained variance in composite strain; 3.926% (3.577% adj) to explained variance in physical strain; and a reduced 3.189% (2.850% adj) to the explained variance in psychological strain. Further, when compared to the incremental effect of role-boundary common study stressors in the model, the role-boundary stressor explains on average 2.3% (adj) or 61.8% more of the variance than the personal desirability of role-insufficiency stressors. Thus, on the basis of these results, there is strong support for the hypothesis (H1b) that the incremental effect of the personal desirability of stressors would add significant information to the cumulative variance when placed in the model. Furthermore, when seen in transactional terms, they suggest that the personal meaning assigned to stressors does in effect contribute significant information to the

mental summation of the appraised imbalance between actual (i.e., recognition of stressors) and ideal (i.e., personal desirability of stressors) stressors and the relationship with symptoms of strain.

The effect of individual differences seemingly underlies the variability in the response to the "Like More" "like Less" and "About Right" response anchors of the evaluative scale. As the results show, the desire for more insufficiency and ambiguity common study stressors explains on average a moderate 14.46% (13.49% adj) of the variance in strain; the desire for less boundary and physical environment common study stressors on average a substantially reduced 3.87% (3.27% adj) of the variance in strain; and the personal satisfaction with insufficiency and ambiguity common study stressors, on average a moderate 14.78% (13.71% adj) of the variability in symptoms of strain. As a result, there was support for the hypothesis (H2) that the desirability of stressors in terms of desirable, undesirable and congruence with stressors will each explain a significant percentage of the variance in strain. Furthermore, if these analyses are taken on face value, they would seem to suggest that individual differences in the personal meaning assigned to stressors discriminate the direction and intensity of their response to the items in the tripolar evaluative scale.

Contrary to this interpretation of the data, however, it may be the case that the effect of social and/or contextual norms or social expectancies for common study stressors overrule or nullify the personal desire for stressors and thereby decree a common expectation of the stressor (Ajzen & Fishbein, 1980; Hesketh & Gardner, 1993). For example, when related to the social context, the role-insufficiency item "Future career prospects from my course" may be seen as an "expected" and desirable facet of study at university. However, it may also be the case that a person may well be dissatisfied (e.g., find they are enrolled in the wrong field of study) or unable to cope (e.g., fear about per-

sonal capabilities) with the future prospects from their current course of study and therefore would be expected to evaluate the prospects from their course as "Like Less" for them. The frequency of responses to the item, however, indicates that a majority or 120 (73.62%) of the participants would "Like More" career prospects from their course and a minority or 43 (26.38%) appraise the prospects of their course as "About Right" for them. Therefore, it would seem that some underlying influence common to the sample underpins the response to the item and thereby overrules the personal desirability of the item. For example, perhaps its the case that the desirability of the item content (e.g., "Future career prospects from my course") effectively subverts or averts the "Like Less" response to the scale items.

Furthermore, when the response distributions are related to the individual scales, the distribution of responses to the Role-Ambiguity and Role-Insufficiency Personal Desirability scales (see Appendix F.1.1.2, Table F.2) are both primarily confined to the "Like More" and "About Right" anchors of the scale. This suggests that an underlying and non-random source of bias determines the direction and range of the responses to these scales (Spector, 1994; Spector & Brannick, 1995). In particular, the percentage of responses to the Like More" anchor of both scales (i.e., 33.50% & 56.07%) exceed the percentage expected for a normal distribution (i.e., 16.0%) and suggests that the locus of bias is located in the "Like More" anchor of the scale. In other words, the response to the items in the scale is in effect uni-directional and as a result fails to reflect a normal distribution. By contrast, the distributions for the other personal desirability scales reflect reasonably normal distributions and suggests that individual differences in the personal meaning assigned to items in the respective scales underlies the variability in the response distributions.

Nonetheless, despite the evidence of response skewness, scales related to each response anchor explain a significant percentage of the variance in physical, psychological and composite symptoms of strain. As such, they indicate that people are able and do discriminate (i.e., appraise) the personal desirability of common study stressors in terms of "Like More" Like Less" and About Right". However, as indicated by the variance explained by the models, the desire for "less" common study stressors explains a substantially lower percentage of the variance in strain. On average, the desire for "more" or "satisfaction" with common study stressors explains a moderate 13.60% (adj) of the variance and the desire for "less" common study stressors, a low 3.27% (adj) of the variance in strain. This suggests that personal variability in the desire for "more' and "satisfaction" with a common stressor are perceived to be the more important aspects of personal desirability in the stressor to strain process. This result, however, may be an underestimate of the importance of "Like Less" appraisals in the relationship between common stressors and strain. An overall compression in the range of the responses to the "Like Less" anchor would seem to reduce the correlations with strain. For example, the SD for the "Like Less" Composite scale (i.e., 7.826) is much lower than those for the "Like More" (i.e., 9.009) and "About Right" (i.e., 15.478) Composite scales; and the correlations with strain substantially lower than those for the "Like More" and "About Right" scales. For example, the "Like More" Composite scale correlates 0.37** with the Composite Strain scale; the "About Right" scale, 0.36** with the Composite Strain scale; and the "Like Less" scale, a much lower 0.19* with the Composite Strain scale.

Furthermore, it could be argued that significant response bias invalidates the imbalance approach to measurement and the prediction of strain. But seemingly not so, the results demonstrate the versatility and specificity of the imbalance format. For instance, they demonstrate that both the personal desirability of common stressors and individual

differences in the personal desirability assigned to common study stressors (i.e., "like More" "About Right" and "Like Less") predict strain. In addition, they indicate the utility of the imbalance scale as a diagnostic of (a) the norms and social expectations of the social context, (b) the values and goals of individual's, (c) personal satisfaction/dissatis-faction with common stressors, and (e) a guide to job design. For example, skewed distributions may reflect the norms of the social context; responses to the "About Right" anchor, the level of personal satisfaction with common sources of stress; and responses to the "Like More" and "Like Less" anchors of the imbalance scale, the nature of the personal meaning assigned to common stressors. That is, the responses provide a guide to (a) the personal context of the environment and (b) the design of work.

In addition, the results from the "Like More" "About Right" and "Like Less" analyses illustrate the linkage or correspondence between the magnitude of the personal desirability assigned to common stressors and symptoms of strain. Further, when these results seen in transactional terms, they show some support for the transactional tenet that the appraisal of an imbalance between actual and ideal stressors results in stress and the subsequent symptoms of strain (Cox, 1978, 1985a; Gotts & Cox, 1988; Lazarus et al., 1985).

As the descriptive and graphical data for both the Composite Personal Desirability and Role-Boundary Personal Desirability scales show, for increases in the personal desire for "more or "less" common study stressors, there is generally an increase in the magnitude of symptoms of strain. Conversely, for increases in the satisfaction with stressors, there is generally a steady decline in symptoms of strain. Thus, from these results, there is seemingly a linear correspondence between (a) the personal desire for "more" or "less" of a common stressor and (b) the personal satisfaction with a common

stressor and symptoms of strain.. Therefore, although restricted to the limitations of descriptive and graphical data, there is support for the hypothesis (H3) that increases in the desire for more or less of a stressor will correspond to increases in symptoms of strain; and increases in the satisfaction with a stressor, to decreases in symptoms of strain.

In addition, it was hypothesised (H4) that the magnitude of mean strain scores corresponding to given levels of both the desirability and undesirability of stressors would be significantly higher than the mean strain scores for corresponding levels of personal satisfaction with common stressors. That is, the study sought to demonstrate that for equivalent levels of an appraised imbalance and balance with stressors (e.g., imbalance and satisfaction scores 1SD from the mean for the respective scales) there are significant differences between the magnitude of corresponding mean strain scores. As the graphical data indicates, there is a noticeable separation between the mean strain scores corresponding to equivalent levels of appraised imbalance and balance with stressors. Further, when these are compared statistically (see Table 3.3.4.13), there are generally significant differences between the mean strain scores corresponding to equivalent levels of personal imbalance and personal satisfaction with common stressors. In other words the data indicates that individual differences underpin the appraisal of stressors and the resultant self-report symptoms of strain. This indicates that people are both able and do effectively discriminate the personal desirability of stressors; and furthermore, that the nature and intensity of the personal discrimination reflects in a corresponding levels of personal strain. Thus, on the basis of this data, there was support for the stated hypothesis (H3).

With respect to the importance of personal hardiness in symptoms of strain, the correlations (see Table 3.3.4.1) indicate that hardiness is both strongly and inversely related to the perception (i.e., recognition) of common study stressors (e.g., -0.50** between

the composite and hardiness scales). Whereas for those between hardiness and the personal desirability of stressors, the relationships are either weak or not significant (see Tables 3.3.4.4 & 3.3.4.9). Further, the results from hierarchical modelling (see Table 3.3.4.13) show that hardiness accounts for a disproportionate 30.53% (29.66% adj) of the 41.99% (40.52% adj) explained by the model; or in proportional terms, 72.70% of the explained variance.

Therefore, given the significance and nature of these correlations and the results from hierarchical modelling, they suggest two transactional models of stress. One a "personality" or "mediational" model of stress which reflects a functional linkage between the perception of stressors and dispositions for hardiness in strain related outcomes. The other, a "cognitive balance" (i.e., "value discrepancy") model of stress which integrates the moderating role of hardiness on the linkage between the perception of stressors and the values/goals of the individual with symptoms of strain. To further explore this issue, a series of additional analyses were conducted. The results are reported in chapter 3.3.4.5.1

3.3.4.5.1 "Personality" and "Cognitive Balance" Models of Stress

The results from previous regression analyses illustrate the significance and dominance of hardiness in both models of best fit and hierarchical models. However, although demonstrating the relative and incremental effect of hardiness on strain, the analyses do not discriminate the specificity of dispositions for hardiness in symptoms of strain. That is, they neglect or fail to account for the role of low and high hardiness cognitive styles in the explanation of strain (Allred & Smith, 1989). As Allred and Smith point out, it is . . .

> presumed that hardy persons respond to potential stressors with positive cognitions or appraisals concerning the nature of the threat and their ability to cope (and nonhardy, the tendency), to respond to the same event with fewer positive cognitions and more negative thoughts (p. 257).

Hardy persons, therefore, would be expected to have a reduced reliance or use of appraisals of personal desirability to interpret the nature of their environment; for example, the personal desirability of common study stressors. As a result, those with a hardy cognitive style would be expected to override the personal desirability of common study stressors. Therefore, based on the assumption that high hardiness reflects a dominant cognitive style, it would be expected that the incremental effect of recognition (i.e., perception) and personal desirability cognitive process will add little or no significant information to the explained variance in strain.

Conversely, for low personal hardiness, persons with a nonhardy cognitive style would be expected to place a high reliance on the use of recognition and personal desirability cognitive processes to interpret common study stressors. That is, low hardy types would be expected to more aware of the presence of common stressors (i.e., recognise stressors) and therefore have more need to evaluate the personal significance of common stressors. In this case, therefore, the incremental effect of recognition and personal desirability cognitive process would be expected to add significant information to the explained variance in symptoms of strain.

To extract high and low samples from the database (n = 162), the 55 cases with highest scores for hardiness and the 54 cases with the lowest scores for hardiness were used were used to form the samples. For each analysis, the variables used in the respective models correspond to those either used or identified as significant in previous analyses.

Table 3.3.4.14 shows that low and high hardiness groups discriminate the importance of the personal desirability assigned to stressors in stressor to strain relationships. For low hardiness, the desirability of role-insufficiency common study stressors explains a

moderate 16.76% (15.16% adj) of the variance in composite strain. Whereas for high personal hardiness, the relationship between the personal desirability of common study stressors and strain is not significant.

Table 3.3.4.14
Backward Regression: Low and High Hardiness Samples - Composite Strain on Personal Desirability

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Low Hardiness	Desir Role-Insuffic#	16.76%	15.16%	0.4094	3.325	.0021
Mult R=.4094; SE 157098; F(1,52), 10.4677, p .0021						
High Hardiness	Nil Significant	----	----	----	----	----

Note: pout ≥ .051 (two-tail); #Transformed Scale

Table 3.3.4.15 shows the relative importance of the personal desirability of common study stressors and common study stressors for low and high hardiness in symptoms of strain. As the table shows, low and high hardiness groups discriminate the importance of recognition (i.e., perception) and personal desirability cognitive processes in stressor to strain relationships.

Table 3.3.4.15
Backward Regression: Low and High Hardiness Samples - Composite Strain on Significant Common Study Stressor and Personal Desirability Predictors of Strain

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Low Hardiness	Desir Role-Insuffic#	16.76%	15.17%	0.4094	3.325	.0021
Mult R=.4094; SE 15.7098; F(1,52), 10.4677, p .0021						
High Hardiness	Role-Ambiguity#	10.66%	8.97%	0.3265	2.519	.0150
Mult R=.3265; SE 19.5094; F(1,53), 6.3230, p .0150						

Note: pout ≥ .051 (two-tail); #Transformed Scale

For the low hardiness group, the desirability of role-insufficiency common study stressors explains a moderate 16.76% (15.17% adj) of the variance; conversely, for the high hardiness group, the recognition of role-ambiguity common study stressors explains a somewhat reduced 10.66% (8.97% adj) of the variance in composite strain.

Table 3.3.4.16 indicates that the effect of dispositions for low and high hardiness discriminate the relative importance and significance of recognition, personal desirability and hardiness cognitive processes in the strain related outcomes. As the table shows, distinctions in low and high hardiness discriminate the functional importance (i.e., the use) of perception, appraisals of personal desirability and dispositional cognitive styles.

Table 3.3.4.16
Backward Regression: Low and High Hardiness Samples - Composite Strain on Significant Common Study Stressor, Personal Desirability and Hardiness Predictors of Strain

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
	Desir Role-Insuffic#			-0.3518	2.824	.0068
Low	Hard Control	35.51%	30.25%	-0.3438	-2.814	.0070
Hardiness	Role-Boundary#			0.2969	2.382	.0212
	Hard Challenge			-0.2721	-2.221	.0310
Mult R=.5959; SE 14.2443; F(4,49) 6.7456; p .0002						
High	Role-Boundary#	17.01%	13.82%	-0.2869	-2.259	.0281
Hardiness	Hard Control			-0.2680	-2.110	.0397
Mult R=.4124; SE 189830; F(2,52) 5.3295; p .0078						

Note: pout ≥ .051 (two-tail); #Transformed Scale

The data for the low hardiness group indicates that the personal desirability of Role-Insufficiency stressors, the recognition of role-boundary stressors and appraisals of low personal control of life events and low personal challenge (i.e., aversion to changing circumstances) explain a high 35.51% (30.25% adj) of the variance in composite strain.

Furthermore, as indicted by the estimates for the model, the appraisal of personal desirability is the most powerful predictor of strain in the model. Thus, for those with low hardiness, the personal desirability assigned to common stressors is, it would seem, the more dominant cognitive process underlying the personal relevance and response to the threat of common study stressors.

For the high hardiness group, however, the personal desirability of common study stressors has no significant effect in the model. The recognition of role-boundary stressors and the appraisal of high personal control of life events, however, explain a reduced but moderate 17.01% (13.82% adj) of the variance in composite strain. Further, the data indicates that the person's recognition of role-boundary stressors is the more powerful predictor of strain in the model. Therefore, if seen in theoretical terms, this result would seem to indicate that the perception of common stressors and appraisals of high personal control of common stressors are in effect mediated by appraisals of high personal hardiness. That is, high hardiness (i.e., hardy cognitive style) may be seen to function as an intervening and higher order appraisal process in the linkage between stressors and strain.

However, when compared to those for the low hardiness solution, the significance of the stressor and hardiness variables (i.e., 0.0281 & 0.0397) in the model is not highly significant and suggests that the cumulative effect of the variables is at best marginal or perhaps not significant. In other words, it may be the case that due to the homogeneous nature of high hardiness (i.e., low variability) and the mediating effect of high hardiness on predictors of strain, that (a) the main effect of high hardiness on strain is not significant; and (b) the recognition and personal desirability of stressors are not significant predictors of strain.

Table 3.3.4.17 shows that low and high hardiness discriminate (a) the direct effect of dispositions for hardiness on strain and (b) the incremental effect of recognition and personal desirability cognitive processes when placed in the presence of dispositions for hardiness on the explained variance in composite strain. Further, it reveals the significant effect of low and high hardiness on the significance of the respective models and the amount of variance explained by the models.

For the low hardiness model, the main or direct effect of hardiness dispositions for low personal control and low personal challenge on strain is not significant (i.e., ΔR^2 = 7.38%, Signif of F, .1418). By contrast, the inclusion of common role-boundary study stressors (i.e., their recognition) in the models adds a moderate and significant 17.64% (16.78%) to the variance in strain explained variance; and likewise, from the addition of the personal desirability of role-insufficiency stressors to the model, a reduced but highly significant 10.50% (9.73% adj) to the variance in composite strain explained by the model. In other words, the table indicates that dispositions for low hardiness act to moderate the functional role of perception and appraisal in the transactional process. On the basis of this data, then, it would seem that the moderating effect of low hardiness acts to (a) decreases the importance of appraisals of low hardiness in the explanation of strain; and (b) increases the importance of perception and personal desirability cognitive processes in the relationship between stressors and strain.

For the high hardiness sample, however, the main effect of dispositions for high control and challenge on composite strain is not significant (i.e., Signif of F .0778); and similarly, the incremental effect of both common role-boundary stressors (i.e., Signif of F .2559) and the personal desirability of role-insufficiency stressors (i.e., Signif of F .0994) are not significant. Furthermore, the variance in strain explained by the model at the final step (9.67% adj) is not significant (i.e., F(4,50) 2.4444, p .0585).

Table 3.3.4.17
Hierarchical Regression: Low and High Hardiness - Composite Strain on Significant Hardiness, Common Study Stressor and Personal Desirability Predictors of Strain

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	T	Sig T
			Low Hardiness (n = 54)					
	Step 1							
Hardiness	Control	7.38%	3.74%	7.38%	.1418	-0.2658	-1.871	.0671
	Challenge					-0.1853	-1.304	.1981
	Step 2							
Stressors	Role-Boundary#	25.02%	20.52%	17.64%	.0012	0.4251	3.430	.0012
	Step 3							
Desirability	Role-Insuffic#	35.51%	30.25%	10.50%	.0068	0.3518	2.824	.0068
Mult R=.5959; SE 14.2443; F(4,49) 6.7455, p .0002								
			High Hardiness (n = 55)					
	Step 1							
Hardiness	Control	9.35%	5.87%	9.35%	.0778	-0.3095	-2.312	.0248
	Challenge					-0.0705	-0.527	.6006
	Step 2							
Stressors	Role-Boundary#	11.64%	6.44%	2.29%	.2559	0.1526	1.149	.2559
	Step 3							
Desirability	Role-Insuffic#	16.36%	9.67%	4.72%	.0994	0.2409	1.679	.0994
Mult R=.4044; SE 19.4351; F(4,50) 2.4444, p .0585								

Transformed Scale

Therefore, it would seem that dispositions for high hardiness act to mediate or reduce the incremental effect of appraisals of high personal control and challenge, the perception (i.e., recognition) of common role-boundary stressors and the appraisals of the personal desirability of role-insufficiency stressors on composite strain. Furthermore, even though high hardiness may be seen to mediate the relationship between predictors and strain, it is not, however, in its own right, significantly related to symptoms of strain.

Summary of Analyses

The data indicates that individual differences in hardiness (i.e., dispositional cognitive styles) discriminate the transactional relationships underlying the imbalance between actual and ideal common study stressors and symptoms of strain. Furthermore, it indicates that two transactional models may be seen to explain the transactional relationship

between stressors and symptoms of strain. One a "cognitive balance" or "value discrepancy" model of stress which reflects the moderating influence of low dispositions for hardiness; the other, a "personality" or "mediational" view of stress which reflects the mediating or reducing effect of high dispositions for hardiness on the linkage between stressors and strain. Further, if seen in terms of applied utility, both models may be seen to have diagnostic utility: the "cognitive balance" model as a both diagnostic of work and guide to the design of work; and the "personality" model, as both a diagnostic of personality characteristics and guide for personnel selection.

3.3.4.5.2 Summary of Discussion

The findings show that the relative and incremental effect of the personal desirability of common study stressors significantly improves the explanation and understanding of the transactional process underlying symptoms of strain. As such, they demonstrate that a "value discrepancy" or imbalance approach to the measurement of common stressors may be used to "personalise" the measurement and explanation of the stressor to strain process.

Furthermore, the results indicate that evaluative measurement enables an instructive insight to the nature of individual differences in personal meaning underlying appraisals of the personal desirability of common study stressors. Specifically, they show that the appraisal or personal meaning of common study stressors in terms of "Like More" "Like Less" and About Right" each explain a significant percentage of the variance in strain. In other words, the results demonstrate that an evaluative approach to measurement may be used to discriminate stressors as either an undesirable facet of the environment or a source of personal satisfaction.

In addition, the results show, that the personal desirability of stressors (i.e., as either undesirable or personal satisfaction) is linked to (a) increases in the magnitude of strain related outcomes and (b) significant differences between mean strain scores corresponding to given levels of personal desirability. People, it seems, are able and do discriminate the personal meaning of common stressors as either an undesirable source of stress or alternatively, as a source of personal satisfaction; and moreover, that such personal distinctions ultimately correspond to either higher or lower levels of strain.

However, although significant in their own right, the results may be seen as somewhat inconclusive. Additional analyses indicate that self-evaluations of personal hardiness (i.e., hardy and nonhardy cognitive styles) may in effect determine the extent to which appraisals of personal desirability are involved in the stressor to strain process. Those with hardy cognitive styles, it would seem, have a reduced reliance on the functional importance or relevance of recognition and personal desirability cognitive processes in the relationship between stressors and strain. Whereas for those with nonhardy cognitive styles, there is seemingly an increased emphasis on the importance of perception (i.e., recognition of stressors) and appraisals of personal desirability in the stressor to strain process. Hardy cognitive styles, it would seem, function to mediate the cognitive processes underlying the stressor to strain process; and nonhardy cognitive styles, a moderating role in the importance of both recognition and personal desirability cognitive processes underling the stressor to strain process. Further, when seen in transactional terms, there is the inference that these distinctions in the nature and functional role of hardiness underpin what are essentially "personality" and "cognitive balance" models of stress. In other words, the data indicates that individual differences in hardiness determine the functional role and relative influence of cognitive processes in the explanation of the stressor to strain process.

One limitation and perhaps the main constraint on the variance in strain explained by the study, was the constriction on the variability of the imbalance score imposed by the six point response format (i.e., +3 to -3) of the evaluative scale. After recoding the negative response options of the scale, the imbalance scores are in effect derived from three point scales (i.e +1 to +3) and those for the "Like More" "Like Less" and "About Right" from two point scales. As a result, the variability of scores is limited and likely further reflects in both the reliability of the variables and correlations between the variables (Tabachnick & Fidell, 1989).

For example, when compared to the average alpha coefficient obtained in study five (i.e., 0.73 - see Appendix E.4.2, Table E.3), the average alpha coefficient for the personal desirability scales (i.e., 0.63) is 0.10 below the average for study five. Similarly, when compared to those for the response anchors (see Appendix E.4.2.1, Table E.5), the alpha coefficients for the present study are generally below those obtained in study five. Therefore, although the correlations between the personal desirability scales and strain (see Table 4.4.1) tend to be a little lower than those obtained in study five (see Appendix E.4.3.1, Table E.6), the lower correlations with strain may in effect result from the reduced reliability of the scales. Thus, considering the detrimental effects that result from constrictions in the variability of raw data, future research should increase the range of the evaluative scale an eight point response format (i.e., +4 to -4).

In addition, although found to be significant predictors of strain when in the presence of common study stressors and hardiness, it may be the case that the personal desirability of common stressors is not a significant predictor of strain when in the presence of expectancy and personal valence cognitive processes. Future research, therefore, should seek to explore the independence and relative effect of expectancy, valence and

personal desirability appraisal processes on strain when in the presence of each other. From this result, it is then possible to clarify the relative importance of the personal meaning assigned to common stressors in the variability of personal strain when in the presence of significant common stressor, coping and dispositional predictors of strain.

Further, there is a need to triangulate the findings from previous studies. The results from this study and previous studies indicate that the recognition of common study stressors in terms of frequency invariably explains the highest percentage of the variance in strain. However, it may also be the case that the recognition of common stressors in terms of "agreement" (i.e., true-false) "intensity" (e.g., pressure) or "duration" explains an equivalent if not greater amount of the variance in symptoms of strain (Dewe, 1991a, Osipow & Spokane, 1983, 1987). In particular, the recognition of common stressors in terms of pressure has attracted a wide body of research (e.g., Anderson, Cooper, & Willmott, 1996; Brown, Cooper, & Kirkcaldy, 1996; Buck, 1972, Cherry, 1978; Davidson & Cooper, 1984, Davis, 1996; Lu et al., 1997; Marshall & Cooper, 1979, 1981; Sutherland & Cooper, 1988; Vagg & Spielberger, 1998; Williams & Cooper, 1998) and suggests that the intensity of common stressors may be used to triangulate the findings of research which measure the recognition of common stressors in terms of their extant frequency.

Study 7

Stress at University: The Role of Common Study Stressors, the Personal Meaning Assigned to Sources of Stress, Coping Strategies and Hardiness Cognitive Styles in Symptoms of Strain

3.3.5.1. Abstract

Using an omnibus measurement model based on the results from studies one to six, this study sought to further explore the role of the personal meaning assigned to sources of intrinsic and extrinsic stress in the transactional relationship between stressors and strain. In particular, it sought to identify the relative importance of specific (i.e., valence, expectancy, beliefs) and more general (i.e., personal desirability) personal meaning dimensions of appraisal on symptoms of strain when in the presence of common study stressors (i.e., recognition of stressors), coping strategies and hardiness cognitive styles.

The results from 205 undergraduate students show support for the principal aim of the thesis. They demonstrate that specific and more general personal meaning appraisal processes contribute significant information to the explained variance in symptoms of strain when in the presence of perception (i.e., recognition), coping and hardiness cognitive processes. Furthermore, and relevant to the principal aim of the thesis, the results indicate that (a) individual differences in expectancies for psychological stress is the most powerful predictor of strain in the measurement model; and (b) the cumulative effect of specific and more general dimensions of appraisal explain the greater proportion (i.e., 74.00%) of the variance in composite strain explained by the model.

In addition, the results demonstrate (a) the conceptual independence of valence, expectancy and personal desirability appraisal processes and likewise, the independence of expectancy psychological stress and hardiness appraisal processes; (b) the significant role of more general personal desirability appraisal processes in symptoms of strain; (c) that hardiness cognitive styles discriminate the importance of cognitive processes in the stressor to strain process; (d) the correspondence between the appraisal of imbalance (balance) with common stressors and symptoms of strain; and (e) that a triangulate approach to measurement may be used to cross-validate the findings of nomothetic research. Taken together, the results demonstrate the importance and significant role of both specific and more general dimensions of appraisal in the transactional process underlying stress and symptoms of strain.

When personal meaning dimensions of appraisal are included in the presence of common study stressors, expectancies for psychological stress, beliefs related to social support and the personal desirability assigned to role-ambiguity stressors account for an additional 17.00% (16.10% adj) of the variance in symptoms of composite strain. Furthermore, when significant personal meaning dimensions of appraisal are included in models of best fit, the personal meaning assigned to sources of stress accounts for variance in physical, psychological and composite symptoms of strain beyond that explained by common study stressors, coping strategies and hardiness cognitive styles. The models of best fit explain 46.00% (45.00% adj) of the variance in physical strain, 43.00% (42.00% adj) of the variance in psychological strain and 54.00% (52.00% adj) of the variance in composite strain.

Hierarchical modeling confirmed the theoretical importance and incremental effect of (a) personal meaning appraisal processes and (b) the importance of personal desirability dimensions of appraisal in the transactional model. The cumulative effect of expectan-

cies for psychological stress, belief social support and the personal desirability of role-ambiguity stressors add an additional 12.00% (11.60% adj) to the variance explained by (a) common study stressors and coping (14.00% -13.50% adj) and (b) hardiness cognitive styles (27.30% - 26.60% adj). As a result, there is support for the principal aim of the thesis that the inclusion of personal meaning dimensions of appraisal in the measurement model would significantly improve the explanation of strain. By contrast, the personal desirability of role-ambiguity stressors adds only an additional 1.60% (1.30% adj) to the variance explained by the physical strain model; and a similar 1.50% (1.30% adj) to the variance explained by composite strain model. Whilst these results indicate support for the hypothesis that the personal desirability of common study stressors would account for variance in strain beyond that explained by common study stressor, personal meaning, coping and hardiness cognitive processes, the additional variance explained by the model is not large.

Furthermore, the results indicate that (a) hardiness cognitive styles discriminate the functional importance of common stressors and personal meaning in strain related outcomes; and (b) mediates the relationship between sources of stress and symptoms of strain. For the low hardiness sample (n = 51), the recognition of common stressors, expectancies for psychological stress, rational/cognitive coping and hardiness dispositions for control explain a high 55.60% (51.70% adj) of the variance in symptoms of composite strain. Whereas for the high hardiness sample (n = 53), the effect of expectancies for psychological stress, beliefs about social support demands and hardiness dispositions for commitment explain a substantially lower 29.50% (25.10% adj) of the variance in symptoms of composite strain.

In addition, the results further illustrate the utility of evaluative (i.e., imbalance) tripolar response scales when used to discriminate the nature of the personal desirability assigned to common study stressors. As the results show, when measured in terms of "Like More" "About Right" and "Like Less", each domain of personal desirability explains a significant percentage of the variance in strain. For example, when stressors are appraised in terms of "Like More", the desirability of role-ambiguity stressors explained 11.70% (11.00% adj) of the variance in composite strain. However, when appraised in terms of "Like Less", the desirability of role-boundary stressors explains a somewhat lower 4.70% (4.00% adj) of the variance in composite strain. Alternatively, when stressors are appraised in terms of "About Right" for the person, the personal satisfaction with role-insufficiency and role-ambiguity stressors accounts for a moderate 13.40% (12.60% adj) of the variance in physical strain; the satisfaction with role-insufficiency and role-overload stressors, 10.00% (i.e., 9.00% adj) of the variance in psychological strain; and the satisfaction with role-ambiguity and role-insufficiency stressors; 14.00% (13.00% adj) of the variance in symptoms of composite strain. Thus, together, the results indicate that individual differences may be seen to underpin the nature of the personal desirability assigned to common study stressors.

The results show also that the nature of the personal desirability assigned to stressors is associated with a corresponding increase or decrease in symptoms of strain. Increases in the desire for "more" or "less" of a stressor correspond to an increase in symptoms of strain; and the appraisal of congruence with a stressor, to a decrease in symptoms of strain. Further, for given levels in the personal desirability assigned to stressors (i.e., dissatisfaction or satisfaction), there are significant differences between the mean strain scores corresponding to dissatisfaction and satisfaction with common stressors. Therefore, this suggests that people are able and do discriminate the personal

relevance of common study stressors. Furthermore, it suggests a linkage between the transactional process underlying stress (i.e., the appraisal of an imbalance or balance between actual and ideal demands) and symptoms of strain. Limitations of the research methodology and directions for future research are discussed.

3.3.5.2 Introduction

In order to further explore the functional role of personal meaning dimensions of appraisal in stressor to strain outcomes, this study was undertaken to build on the findings from studies one to six. It sought to:

(a) replicate the variance in strain explained by specific and more general measures of the personal meaning assigned to sources of stress;
(b) triangulate the variance in strain explained by frequency measures of common stressors;
(c) identify the degree of conceptual independence and the relative importance of specific and more general personal meaning levels of appraisal in the stressor to stain relationship;
(d) further explore the correspondence between the personal desirability of common stressors and symptoms of strain; and
(e) further explore the mediating role of hardiness cognitive styles in the stressor to strain process.

In essence, then, the study sought to further explore the operationalisation of the transactional constructs in the conceptual model; that is, it sought to identify the functional importance of specific and more general levels of appraisal in the stressor to strain relationship. Therefore, if seen in measurement terms, the measurement model may be seen to operationalise the role of individual differences in appraisal as a cognitive process (see Chapter two: Section 2.2.4 and Figure 2.2.2). It does so, through measurement of (a) the overall appraisal process using the construct of hardiness to represent the totality of the appraisal process; and (b) it also seeks to operationalise the role of individual differences in the operation of this cognitive process using a number of hypothetical sub-processes measured as either evaluative or descriptive dimensions of

the appraisal process (Ajzen & Fishbein, 1980; James & Jones, 1980; Locke, 1969). For example, self-report measures of the valence, expectancy and personal desirability assigned to common stressors and the recognition of stressors in terms of pressure may be seen to represent sub-components or lower order levels of the appraisal process.

The results from studies five and six demonstrate that the nature of the personal desirability assigned to common work stressors has (a) both conceptual and applied utility and (b) contributes useful information to the explained variance in symptoms of strain. In addition, the results of study six showed that appraisals of personal hardiness (i.e., cognitive styles) explain a significant percentage of the variance in symptoms of strain. Furthermore, they indicate that individual differences in low and high personal hardiness discriminate (i.e., mediate) the functional importance of perception (i.e., recognition of common stressors) and personal meaning dimensions of appraisal in the stressor to strain process.

However, although significant in their own right, the results from previous studies may be somewhat misleading or even an artefact of the methodology used to investigate the importance of personal meaning dimensions of appraisal in strain related outcomes. Due to the evolutionary or unfolding nature of the research, each study has essentially restricted its focus to the relative importance of specific dimensions of personal meaning in the stressor to strain relationship. That is, the studies have not specifically sought to investigate the relative importance of perception (i.e., recognition) of personal meaning appraisal processes (i.e., specific and general) using an omnibus (i.e., holistic) measurement model. As a result, they have not sought to identify (a) the relative importance of valence, expectancy and personal belief dimensions of appraisal in the translation of stress to symptoms of strain; (b) the relative importance of personal desirability appraisals when in the presence of both specific and more general dimensions of

appraisal in stressor to strain relationships; and (c) the mediating role of coping strategies and dispositional cognitive styles when in the presence of both specific and more general dimensions of appraisal underlying the adjustment to stress and strain related outcomes.

As the results from studies one to three show, although rarely significant predictors of strain, correlations and graphical data suggest that valence (i.e., personal attractiveness of common stressors) appraisal processes may in effect underlie higher order more general appraisal processes. In short, the data implies that valence appraisal processes likely fuse with expectancy (i.e., expected effect of common stressors) appraisal processes to form the more general personal desirability (i.e., the desire for "more" "less" or "sat-isfaction" with common stressors) appraisal processes. In contrast, and although in general rather small, the results indicate that the more specific expectancy appraisal processes consistently add significant information to the explained variance in strain when in the presence of both common stressor and coping cognitive processes. That is, they demonstrate the relative importance of expectancy appraisals when in the presence of cognitive processes concerned with (a) the recognition of common stressors and (b) the use of preferred coping strategies in the stressor to strain process. Further, if the results are seen in terms of both conceptual and applied utility, it was concluded that although the measurement of the expectancy of common study stressors may have substantial heuristic (i.e., conceptual) utility, it has little applied utility as a predictor of strain related outcomes.

In addition, the results from study four show that the personal importance assigned to sources of stress is not necessarily confined to appraisals of common stressors. The results for the study demonstrate that individual differences in the nature of expectancies associated with personal well-being (i.e., self-efficacy) and general beliefs concerned

with the demands of social relationships add significant information to the explained variance in symptoms of strain. Expectancy appraisals associated with the expected effect of deficits in personal well-being on work performance were found to explain a significant percentage of the variance in strain when in the presence of common work stressors. Further, when used as the basis to discriminate the role of individual differences in the stressor to strain process, expectancies for well-being were found to moderate the relationship between appraisals of rational/cognitive coping and symptoms of strain. Similarly, personal beliefs associated with the provision of social support were found to explain a significant percentage of the variance in strain in models of best fit. Moreover, when used in moderator analyses to explore the role of individual differences in the stressor to strain relationship, the significant interaction between personal beliefs and neuroticism was found to moderate the relationship with symptoms of strain.

Furthermore, in contrast to the necessity to replicate or cross validate the significance of findings derived from nomothetic measurement, the alternative approach to the cross validation (i.e., across contexts or populations) of nomothetic methodologies, is to triangulate (Cox & Ferguson, 1994; Ivancevich & Matteson, 1988; Jick, 1979; McGrath, 1970a) the results from previous studies by using an alternative approach to the measurement of common stressors (Dewe & Brook, 1997; Lepore, 1995). As the findings from previous studies show, the measurement of common stressors in terms of frequency tends to explain the greater proportion of the variance in symptoms of strain. However, it may also be the case that the recognition of extant common stressors in terms of their prevailing intensity (i.e., pressure in terms of "definitely is" or "definitely not" a source of pressure); or alternatively, the duration of extant common stressors are equally effective predictors of strain (Buck, 1972; Cohen et al., 1995; Cooper, 1983;

Dewe, 1991a; Marshall & Cooper; 1979, 1981; Osgood et al., 1957; Osipow & Spokane, 1983, 1987). In particular, the perceived pressure of common work stressors has attracted a wide body of research (e.g., Cooper et al., 1988; Davis, 1996; Lu et al., 1997; Marshall & Cooper, 1979, 1981; Sutherland & Davidson, 1993; Vagg & Spielberger, 1998; Williams & Cooper, 1998) and suggests that this approach to the measurement of common stressors is a viable alternative to frequency measures of common stressors.

Therefore, given (a) the conceptual limitations underlying the results from studies one to six and (b) the possibility of conceptual redundancy in the measurement model from the overlap or commonality of cognitive processes, the principal aim of the present study was to further explore the relative importance of specific and more general appraisal processes in symptoms of strain.

The principal aim of the present study reflects three stages of data analysis. First, it sought to identify the degree of conceptual independence of the more specific personal meaning (i.e., valence, expectancy, beliefs related to social support and expectancies associated with personal well-being) and more general personal meaning (i.e., desirability assigned to common study stressors) appraisal processes. Second, it sought to identify the relative effect of both specific and general appraisal processes associated with the appraisal of stressors on symptoms of strain when in the presence of common study stressor, coping and dispositional cognitive processes. Third, it sought to confirm the relative importance of the more general appraisals of the personal desirability of common study stressors in the mental summation of the imbalance between actual and ideal stressors in the transactional process underlying stressor to strain outcomes.

The secondary aims of the study sought to further explore facets of the stressor to strain process. First, it sought to triangulate the results from previous studies by shifting the focus of measurement of common study stressors from an explicit emphasis on the perceived frequency of stressors to the perceived pressure (i.e., intensity) of common sources of stress. Second, it sought to further explore the relationship between the appraisal of stressors as either (a) desirable (i.e., "Like More"), (b) undesirable (i.e., "Like Less") or (c) congruent with personal value standards (i.e., "About Right") and symptoms of strain. Third, it sought to further explore the mediational role of low and high hardiness cognitive styles in the stressor to strain process. Fourth, from the variables included in the omnibus model (i.e., common stressor, personal meaning, coping and hardiness predictors of strain), it sought to identify the model of best fit or the most parsimonious model that best explains the variability in symptoms of strain reported by the participants in the study. In addition, the study sought to further explore the relationship between stressors and strain using physical, psychological and composite measures of strain (see Appendix G.4 & Table G.18).

The study sought to test the following hypotheses:

H1 That the personal meaning assigned to sources of stress will account for a significant percentage of the variance in symptoms of strain when placed in the presence of dispositional (i.e., hardiness) and recognition (i.e., common study stressor and coping) cognitive processes.

H2 That the personal desirability assigned to common study stressors will account for a significant percentage of the variance in symptoms of strain when placed in the presence of significant dispositional, common study stressor, coping strategy and personal meaning predictors of strain.

H3 That the personal desirability of common study stressors when measured in terms of (a) desirable, (b) undesirable and (c) congruence will each contribute significant in formation to the explained variance in symptoms of strain.

H4 That increases in the desirability or undesirability of common study stressors will correspond to an increase in symptoms of strain; conversely, for increases in the congruence (i.e, satisfaction) with stressors, to a decrease in symptoms of strain.

H5 That the mean strain scores corresponding to the desirability or undesirability of common study stressors will be significantly higher than mean strain scores corresponding to congruence (i.e., satisfaction) with stressors.

3.3.5.3 Method

3.3.5.3.1 Participants

Two hundred and seven undergraduate university students enrolled in either first, second or third year courses took part in the study. Of these, 42 were male and 167 female; 173 were full time students and 34 part time students; 17 were employed in full time work, 114 in part time work and 76 were not employed; 80 were enrolled in a Bachelor of Arts (Psychology) course of study, 113 in a Bachelor of Psychological Science course of study and 14 in other Bachelor courses of study (e.g. commerce, languages). The mean age of the participants was 23.6 years and ranged from 18 years to 54 years. The average grade for the students coursework was 68.56%.

3.3.5.3.2 Self-Report Measurement

Self-Report scales were used to measure (a) the recognition (i.e., description) of common study stressors; (b) evaluations of the personal desirability of common study stressors; (c) the personal valence and expectancy assigned to common study stressors; (c) expectancies related to personal well-being; (d) personal beliefs associated with social support demands; (f) coping strategies and (g) dispositions for hardiness. In addi-

tion, self-report measures of physical and psychological strain were included in the inventory to measure the symptoms of strain more recently experienced by the students participating in the present study (see Appendix G.6, Stress at University Survey).

3.3.5.3.2.1 The Measurement of Common Study Stressors

The "Sources of Stress" scales from the Cooper et al. (1988) Occupational Stress Indicator (OSI) inventory were used to measure the perceived pressure (i.e., intensity) of common study stressors (see Appendix G.6.3, Sources of Pressure In Your Study Scale). As Cooper et al. note, the 61 item scale measures sources of job pressure which reflect six general areas of work: "Factors intrinsic to the job" (9 items); "Managerial role" (11 items); "Relationships with people" (10 items); "Career and achievement" (9 items); Organisational structure and climate" (11 items) and those related to the "home/work interface" (11 items). The scale uses a six point response format and response anchors ranging from "Very definitely is a source of pressure" (6) to "Very definitely is not a source of pressure" (1) to measure sources of job pressure.

Where necessary, items in the OSI "Sources of pressure" scales were modified to reflect the nature of common study stressors relevant to the university context. For example, the "Intrinsic to the job" scale item "Having to work very long hours" was reworded to "Having to study very long hours"; and the "Career and achievement" scale item "Overpromotion - being promoted beyond my level of ability" reworded to "Overextended - being expected to do coursework beyond my level of ability".

The OSI inventory has been widely used in stress research (e.g., Anderson, et al., 1996; Bradley & Sutherland, 1993; Cooper, 1983; Cooper et al.,1988, 1989, Cunha, Cooper, Moura, Reis, & Fernandes, 1992; Hurrell Jr. et al.,1998; Lu et al., 1997; Davis, 1996; Rees & Cooper, 1992b; Sutherland & Davidson, 1993; Vagg & Spielberger, 1998; Wiliams & Cooper, 1998) and indicates the wide acceptance of the OSI stressor

scales as measures of perceived job pressure. Cooper et al. (1988; 1989) report (a) that the OSI scales have satisfactory validity (i.e., content and construct) and split-half reliability psychometric properties and (b) normative data for a range of occupational groups. Further, Cunha et al. (1992) report moderate Cronbach alpha coefficients for the stressor scales; they range from 0.65 for the scale "Factors intrinsic to the job" to a maximum of 0.78 for the scale "Career and achievement". More recently, however, Davis (1996) found that the alpha coefficients for the stressor scales all exceed the minimum level of 0.70 for acceptable internal consistency. The coefficients ranged from a minimum of 0.71 to a maximum 0.87.

There is, however, some doubt on the content (i.e., factorial) validity of the OSI "Sources of Pressure" scales (Davis, 1996; Hurrell Jr. et al.,1998; Lu et al., 1997; Williams & Cooper, 1998). Davis (1996) from a factor analysis of the 61 items in the "Sources of Pressure" scale reports that the scale may be reduced to 49 items and four factors termed "Managerial Responsibility" (11 items); "Organisational Culture" (18 items); "Work Demands" (13 items) and "Personal Demands of Work" (7 items). Similarly, Lu et al. (1997) report that the Chinese version of the "Sources of Pressure" scale is reduced to 57 items and four sub-scales.

3.3.5.3.2.2 Measurement of Personal Desirability

The five item tripolar response scales used in study six were used to measure the personal desirability of role-ambiguity, role-boundary, role-insufficiency, role-overload, role-responsibility and physical environment common study stressors (see Appendix G.6.8, Study Demands Evaluation Questionnaire). Chapters 3.3.2, 3.3.2.1 and 3.3.2.2 provide a detailed description of the theoretical basis, design and transformation issues underlying the application of evaluative response scales to measure the nature of the personal desirability assigned to objects and events. The results from study five indi-

cate that the alpha coefficients for the seven point desirability scales range from a marginal 0.5223 for the Physical Environment scale to a moderate 0.8467 for the Role-Insufficiency scale. By contrast, those for the six point scales used in study six range from a low 0.44 for the Physical Environment scale to a moderate 0.66 for the Role-Ambiguity and Role-Insufficiency scales. In other words, the reduction in the response range of the six point scale would seem to reflect as a reduction in the internal consistency of the items in the respective scales. Hence, in attempt to improve the reliability of the scales, the tripolar response format was increased from a six point (i.e., +3 to -3) to an eight point response format (i.e., +4 to -4).

3.3.5.3.2.3 Measurement of Valence and Expectancy

The 12 item scales used in study one were used to measure the personal valence and the expectancy assigned to role-ambiguity, role-boundary, role-insufficiency, role-overload, role-responsibility and physical environment sources of stress (see Appendix G.6.1, Study Demands Valence Scale & Appendix G.6.4, Study Demands Expectancy Scale). A detailed description of these scales is provided in Chapters 3.2.1.3.2.4, 3.2.1.3.2.4.1 & 3.2.1.3.2.4.2. However, in contrast to the bipolar seven point response formats (i.e., +3 - 0 -3) used in study one, an eight point bipolar response formats (i.e., +4 to -4) were used for the present study. The results from study one (see Appendix A.1.2, Table A.2) indicate that the alpha coefficients of the valence scales range from a low 0.17 for the Role-Ambiguity scale to a maximum of 0.70 for the Role-Responsibility scale. Further, with the exception of the Role-Responsibility scale, the responses to scale items are negatively skewed and may account for the low reliability of the valence scales. By contrast, the alpha coefficients for the expectancy scales are generally moderate and range from a low 0.51 for the Role-Insufficiency scale to a maximum of 0.85 for the Role-Responsibility scale.

3.3.5.3.2.4 Measurement of Expectancies for Psychological Stress

The five item Expectancy Psychological Stress Scale used in study four (see Appendix D.3.3) was used to measure the expectancies related to the expected effect of psychological symptoms of stress on study performance (see Appendix G.6.10, Expectancy Psychological Stress scale). A detailed description of the design of the scale is provided in Chapter 3.2.4.3.2.3. Psychometric data for the scale (see Appendix D.1.1, Table D.1) indicates that the internal consistency of items in the scale is moderate (i.e., $\alpha = 0.7894$). However, in contrast to the "yes" (3) "No" (0) "Sometimes" (1) response format used in study four, an eight point bipolar response format (i.e., +4 to -4) with response anchors ranging from "Most certainly likely" (+4) to "Most certainly unlikely" (-4) was used for the present study. Furthermore, as the expectancy items originate from items used in the Psychological Strain scale, there is the possibility of a semantic overlap with the strain scales used in the present study. Chapter 3.2.4.4.3 and Table 3.2.4.3 provide a qualitative and quantitative assessment of this methodological issue.

3.3.5.3.2.5 Measurement of Beliefs Social Support Demands

The five item "Belief Social Support Demands" scale designed for use in study four was used for the measurement of personal beliefs associated with the provision of social support (see Appendix G.6.9, Personal Resources and Demands Questionnaire). A detailed description of this scale is provided in Chapter 3.2.4.3.2.4. The results from study four indicate that the internal consistency of the items in the scale is marginal (i.e., $\alpha = 0.5510$). This result, however, may reflect the significant positive skewness (i.e., constrictions in the variability of the responses to the items) of the responses to items in the scale. Further, in contrast to the "Yes" (3) "No" (0) "Sometimes" (1) used in study four, an eight point bipolar response format (i.e., +4 to -4) and response an-

chors ranging from "Most of the time" (+4) to "Rarely or never" (-4) was used in the present study. Moreover, due to the behavioural emphasis of the personal belief items and similar to the procedure used in study four, the items were dispersed throughout the coping scale (see Appendix G.6.9, Personal Resources and Demands Questionnaire).

3.3.5.3.2.6 Measurement of Coping Strategies

Due to the lengthy nature of the inventory used in the present study, it was necessary to use a more parsimonious measure of coping strategies. Therefore, to satisfy the requirements for the present study, a factor analysis of the data for the 40 item PRQ coping scale (Osipow & Spokane 1983, 1987) used in study four (see Chapter 3.2.4.3.2.2 & Appendix D.3.4) was used to extract six item scales which measure the participants use of "Recreational" "Physical" "Social Support" and "Rational/ Cognitive" coping strategies to cope with stress and symptoms of strain. A subsequent factor analysis of this 24 item scale using data from the present study was used to confirm the content stability of the six item scales used in the inventory.

The initial factor analysis of the 40 item PRQ coping scale employed in study four sought to (a) confirm the four factor structure of the PRQ coping scale and (b) select items for the modified scale. Similar to the data for the PRQ scale (Osipow & Spokane, 1987), a four factor solution with varimax rotation was found to best represent the latent structure of the 40 item PRQ coping scale. From this solution, the six items with the highest factor loadings on each factor were then chosen to form the six item coping scales used in the present study (see Table 3.3.5.1 for items in the scale).

However, due the low case to variable ratio used in study four to extract the factor solution (i.e., 132:40 = 3.3:1), the solution may in effect be somewhat unstable (Cox & Cox, 1991; Smith et al., 1993). As Tabachnick and Fidell (1989) and likewise Smith et al. (1993) point out, when the inter-item correlations are not strong, a minimum of five

cases to each observed variable is required to achieve a stable factor solution. Further, as indicated by the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for the item correlation matrix, the index of 0.6603 may be seen as only mediocre and suggests that the correlation matrix is marginal for a reliable and valid factor analysis (Norusis, 1988b; Smith et al., 1993). In addition, the reproduced correlation matrix indicated that 409 (52.0%) of the residuals in the matrix were greater than 0.05 in magnitude. That is, due to the low case/variable ratio, the residuals indicate that the factor solution is somewhat unstable and thereby not a very good fit of the observed data. Therefore, to verify the factor structure of the six item coping scales used in the present study, it was necessary to establish the stability of the coping scales by using data with an adequate case/variable ratio.

A sample size of n = 205 and case/variable ratio of 8.54:1 for the present study (see Appendix G.1.1.1, Table G.1) indicate that a stable or reliable factor solution may be identified from the 24 items used in the modified coping scale. Table 3.3.5.1 demonstrates that the factor solution with varimax rotation verifies the latent structure of the 24 item coping scale. The KMO index is increased to 0.7784 and the reproduced correlation matrix indicates that only 126 (45.0%) of the residuals are greater than 0.05 in magnitude. Further, cross loadings of the variables across the factors are minimal and restricted to four variables. Equally important, with the exception of the order in the factor solution and changes in the factor loading of five variables, the factor solution is identical to that for the original solution.

In contrast, to the original solution in which recreational and social support coping were identified as the first and second factors in the solution, the factor labelled "social support" emerged as the principal factor in the present solution. In addition, variables 186 and 187 which originally loaded on the rational/cognitive factor now load on the

recreational factor; variables 189 and 190 move from the recreational factor to the rational/cognitive factor; and variable 188 from the rational/cognitive factor to the physical factor. Thus, on the basis of this solution, the items in the six item coping scales were revised to reflect the loading of items on the respective "Social Support" (6 items), "Recreational" (6 items), "Physical"(7 items) and "Rational/Cognitive" (5 items) orthogonal factors.

Table 3.3.5.1
Factor Analysis - Principal Components Extraction: Modified PRQ Coping Scale Items.

Varimax Rotation		Factor Loadings*			
Scale Items		Fact 1	Fact 2	Fact 3	Fact 4
Social Support Coping					
One Good Friend	(V198)	.8797			
One Important Person	(V197)	.8743			
One Person Really Close	(V194)	.8491			
One Sympathetic Person	(V193)	.7760			
I Feel Loved	(V199)	.7192			
Circle of Friends	(V203)	.6287			
Recreational Coping					
Time To Do Things I Enjoy	(V184)		.7865		
Able to Use Free Time	(V185)		.7662		
Get Sleep I Need	(V183)		.6295		
Participating in Activities	(V187)		.5778	.4499	
Able to Put Job Out of Mind	(V186)		.5571		
Free Time on Hobbies	(V192)		.5277	.4265	
Physical Coping					
Community Activities	(V205)			.7406	
Benefit From Formal Groups	(V195)			.6771	
Avoid Unhealthy Food	(V200)			.5028	
Careful With Diet	(V204)			.5006	.4661
Regular Exercise	(V188)		.3351	.4489	
Engage in Meditation	(V211)			.4361	
Regular Physical Checkups	(V202)			.4058	.3217
Rational/Cognitive Coping					
Once Set Stick to Priorities	(V190)				.7082
Avoid Distraction	(V189)				.6320
Consequences For Choices	(V206)				.5625
Systematic Approach	(V209)				.5552
Aware of Personal Behaviour	(V208)				.4283
Eigen Values		5.2589	2.880	2.4711	1.5368
Cumulative Variance		21.9%	33.9%	44.2%	50.6%

Note: n = 205; Case/variable ratio - 8.54:1; *Factor loadings 0.3 or greater shown; KMO = 0.7778; Bartlett Test of Sphericity = 1860.8355, p .0000; Reproduced Correlations Residual's - 126 (45.0%) > 0.05.

3.3.5.3.2.7 Measurement of Hardiness

The short form 30 item multidimensional hardiness scale devised by Bartone et al. (1989) was used to measure dispositions for hardiness (see Appendix G.6.6, Life Disposition Scale. As Bartone et al. (1989) note, in addition to providing a more general measure of hardiness cognitive styles, it is possible to extract 10 item sub-scales from the hardiness scale which measure dispositions for personal control, commitment and challenge. Chapter 3.3.4.3.2.3 provides a detailed description of the hardiness scale.

The results from study six indicate that the psychometric properties of the hardiness scales are satisfactory and compare with those reported by the authors. The responses to items in the respective scales are normally distributed and the alpha coefficients range from a minimum of 0.64 for the control scale to a maximum of 0.81 for the general measure of hardiness. However, in contrast to the six point response format used in study six, the present study adopted a differential eight point response format (i.e., +4 to -4) and the tripolar anchors "Very true" "Now and then" and "Very false" to measure the individual's self-evaluation of personal hardiness.

3.3.5.3.2.8 Measurement of Symptoms in Strain

The 20 item Personal Health scale (Osipow & Spokane, 1983, 1987; Smith & Bennett, 1983) used in previous studies (e.g., study six) was used to measure how frequently the participants suffer from symptoms of physical strain (see Appendix G.6.7, Personal Health Scale). In addition, similar to previous studies (e.g., study six), the 10 item Psychological Strain scale from the OSI inventory (Osipow & Spokane, 1983, 1987) was used to measure the participants more recent symptoms of psychological strain - i.e., negative mood states and problems of adjustment (see Appendix G.6.5, Psychological

Strain Scale). Furthermore, a 30 item Composite Strain scale may also be formed from the items used in the Personal Health and Psychological Strain scales. Chapter 3.2.2.3.2.2 provides a more detailed description of these scales.

The results from study six indicate that the items in the Personal Health, Psychological Strain and Composite Strain scales have high internal consistency. The alpha coefficients range from 0.88 for the Personal Health scale to 0.91 for the Composite Strain scale. Further, in contrast to the six point response format used in study six, the present study adopted an eight point differential response format (i.e., +4 to -4) to measure symptoms of physical and psychological strain. The response anchors for the Personal Health scale range from "Very often" (+4) to "Rarely or never" (-4); and those for the Psychological Strain scale range from "Most of the time" (+4) to "Mostly never" (-4).

3.3.5.3.3 Design and Materials

This correlational field study required participants to answer a self-report inventory with ten questionnaires and a total of 216 items. Furthermore, although the inventory is extensive in nature, the use of volunteer university student as participants and no time limits to complete the inventory, problems such as comprehension of the items, mental fatigue, boredom with the task and carry-over effects (Anastasi, 1982; Christensen & Stoup, 1986; Oppenheim, 1966) were not expected to adversely influence the reliability and validity of the responses to scale items. Furthermore, although some participants may find it difficult to make the conceptual distinction between semantically similar constructs (see qualitative results Appendix A.1.1), the results from previous studies demonstrate that participants are able to discriminate semantically similar constructs (i.e., valence and expectancy).

3.3.5.3.4 Procedure

Participants were approached in lectures and tutorials and asked if they would like to participate in the research. Participants were advised that the questionnaire would take at least 45 minutes to complete and that for those enrolled in Psychology courses of study, participation in the research would either satisfy a course requirement or attract a credit point toward their final grade for the course of study. Following a brief outline of the questionnaire, it was then distributed to participants. Participants were asked to return their completed questionnaires to the researcher or alternatively, they would be collected from the participants during tutorials. Using this method of distribution, 400 students volunteered to take part in the study. Of these, 207 returned completed questionnaires, a response rate of 51.75%.

3.3.5.4 Results

3.3.5.4.1 Data Screening and Assumptions for Normality

Descriptive statistics, frequency plots and a series of multiple regression analyses were used to screen the raw data (n = 207) for evidence of (a) random and non-random missing values, (b) violation of the assumptions for normality and linearity and (c) the presence of univariate and multivariate outliers in the data set (Brown & Di Milia, 1995; Orr et al., 1991; Tabachnick & Fidell, 1989).

A total of 239 missing values was evident throughout the data set and averaged 1.11 per variable across the variables in the data set. These ranged from a minimum of one for 66 of the variables, two for 38 of the variables, three for 23 of the variables, four for one of the variables, six for the biographical item "No of years enrolled at university"

and a maximum of 18 for the biographical item "Overall Average for Coursework". In addition, there was evidence of non-random missing values from four of the participants. Two of the participants failed to record a response to 16 items (i.e., var 20 to var 35) and one participant a response to 23 items (i.e., var 36 to var 58) in the OSI Sources of Pressure in Your Study scale (see Appendix G.6.3). Further, one participant failed to record a response to any of the 12 items (i.e., var 8 to var 19) in the Study Demands Valence Scale (see Appendix G.6.1). The random missing values were subsequent replaced with the scale response value closest to the mean value for the variable; and those for the biographical and non-random missing values, with the mean value for the respective variables. Furthermore, 21 (i.e., 10.15%) of the participants at times recorded a joint "+1" and "-1" midpoint response to items throughout the inventory. That is, although giving a midpoint response to a particular item, they were seemingly unable at times to discriminate the intent of the item as either a discrete "+1" or "-1" response. In the extreme example, one participant recorded 71 (i.e., 47.97%) joint midpoint responses to the 148 items with a differential response scale. Where these occurred, the item was scored in the non-stressful direction. For example, valence items were scored as "+1" (i.e., stressor as good); expectancy items "-1" (i.e., unlikely to cause to stress); and personal desirability items "+1" (i.e., would like more of the stressor).

Frequency plots were used to explore the normality of the variables used in the measurement model. Where necessary univariate outliers and values distant from the general distribution were recoded to values less distant from the next most deviant value in an attempt to improve the normality of the data distribution (Tabachnick & Fidell, 1989). Variables with extreme skew coefficients (see Appendix G.1.1.1, Table

G.2 & Appendix G.1.1.2, Table G.4) were then transformed to approximate normal distributions using either square root, logarithmic or inflection transformations of the data distributions.[1]

In addition, a series of regression analyses explored the data for evidence of multivariate outliers. From these analyses two cases were initially identified as multivariate outliers and thus removed from the data set. The remaining 205 cases in the data set provide the desired power of 0.80 at α 0.05 (Two Tailed) with which to detect a significant medium effect size (ES) of 0.15 from the effect of $k = 8$ independent variables (IV's) in a multiple regression model (see Cohen & Cohen, 1983, p. 118).[2] Specifically, to achieve a desired statistical power of 0.80, requires a minimum of 107 cases (Cohen, 1992, Table 2, p.158). Furthermore, the case to IV ratio of 25.62:1 exceeds the requirement for a minimum of five cases to each IV in multiple regression analyses (Tabachnick & Fidell, 1989).

3.3.5.4.2 Descriptive Statistics

Descriptive statistics ($n = 205$) for the OSI common stressor, coping strategies, hardiness and strain scales is shown in Appendix G.1.1.1, Table G.2; comparative statistics for the OSI stressor scales in Appendix G.1.1.1, Table G.3; descriptive data for the Personal Desirability, Valence, Expectancy, General Beliefs Social Support and Expectancy Psychological Stress scales in Appendix G.1.1.2, Table G.4; the frequency of responses and "goodness of fit" statistics for the "like More" "About Right" and "Like

---

[1] See footnote 1, Chapter 3.2.2.5.1 re values for skewness. This study has adopted a more conservative approach to normality and used an alpha level of .023 to determine maximum skewness. Skew coefficients greater than two SE's (i.e., 0.340) were considered to reject the null hypothesis for skewness.

[2] See footnote 2, Chapter 3.2.2.5.1 for a discussion on the calculation of desired power for single set multiple regression analyses.

Less" response anchors of the Personal Desirability scale in Appendix G.1.1.2, Table G.5; and descriptive statistics for the "like More" "About Right" and "Like Less" response anchors of the Personal Desirability scale in Appendix G.1.1.2, Table G.6.

3.3.5.4.3 Scale Correlations

Pearson zero-order correlations (n = 205) with the OSI stressor scales and the factor solution from a factor analysis of the OSI scales are shown in Tables 3.3.5.2 and 3.3.5.3 respectively; those with personal desirability scales in Table 3.3.5.4; and those with the stressor valence scales in Table 3.3.5.5. In addition, correlations between the stressor expectancy, personal belief, expectancy psychological stress, coping, hardiness and strain scales are shown in Table 3.3.5.6; correlations between the items in the Expectancy Psychological Stress scale and (a) the Strain scales and (b) corresponding items in the Psychological Strain scale in Table 3.3.5.7; and those between the original and transformed scales and strain are shown in Table 3.3.5.8. Furthermore, correlations between the "Like More" "About Right" and "Like Less" personal desirability scales and strain are shown in Tables 3.3.5.9, 3.3.5.10 and 3.3.5.11 respectively; and those between the composite personal desirability, hardiness and strain scales in Table 3.3.5.12.

The sample size n = 205 provides a desired minimum power of 0.80 at α .05 (Two Tailed) with which to detect a medium ES of r =0.30. As the tables for power provided by Cohen (1992) indicate, to detect a medium ES or population r of 0.30 at α .05 (Two Tailed) requires a minimum sample size of n = 85 (see Table 2, p. 158) to achieve a minimum power of 0.80. The correlations reflect two-tailed tests for significance at $\alpha \leq$ .05* or .01** as indicated.

3.3.5.4.3.1 OSI Stressor Scale Correlations

Correlations between the OSI stressor scales and the Physical, Psychological and Composite Strain scales vary from low to moderate and are all significant (see Table 3.3.5.2). They range from a low 0.26** between the Structure/Climate scale and Psychological Strain scale to a moderate 0.47** between the OSI Composite scale and Composite Strain scale. In contrast, correlations between the OSI stressor scales are either moderate or high and range from a minimum of 0.53** between the Structure/Climate and Home/Work scales to a maximum of 0.76** between the Managerial Role and Career scales. Further, six of the interscale correlations are ≥ 0.70 and indicates that one or more of the OSI stressor scales is in effect redundant (Tabachnick & Fidell, 1989). In addition, correlations with the OSI Composite scale are all high and indicate the uni-dimensional nature of the composite scale. They range from a minimum of 0.77** for the correlation with the Home/Work scale to a maximum of 0.88** with the Career scale.

Personal Desirability and Valence

Although low, correlations between the OSI and Personal Desirability scales are generally significant. The significant correlations range from a minimum of 0.17* to a maximum of 0.46** between the Structure/Climate and Physical Environment scales. In addition, although generally low, correlations between the OSI scales and the Composite Personal Desirability scale are all significant; and similarly those between the personal desirability scales and the OSI Composite scale are all significant. As a result, it is reasonable to conclude that the OSI and personal desirability scales are essentially independent in nature.

Table 3.3.5.2
Correlations: OSI Stressor Scales With Personal Desirability, Valence, Expectancy, Belief Social Support, Expectancy Psychological Stress, Coping, Hardiness and Strain Scales

Scale	1	2	3	4	5	6	7
OSI Stressor							
1. Intrinsic to Job	---						
2. Managerial Role	.69**	----					
3. Relationships	.63**	.74**	----				
4. Career	.68**	.76**	.72**	----			
5. Structure & Climate	.64**	.74**	.75**	.72**	----		
6. Home/Work	.57**	.54**	.63**	.60**	.53**	----	
7. Composite OSI	.82**	.87**	.87**	.88**	.86**	.77**	----
Personal Desirability							
8. Role-Ambiguity	.31**	.31**	.25**	.29**	.36**	.21**	.34**
9. Role-Boundary	.21**	.28**	.23**	.20**	.40**	.14	.29**
10. Role-Insufficiency	.37**	.37**	.30**	.40**	.43**	.24**	.41**
11. Role-Overload	.24**	.18**	.14	.12	.21**	.11	.20**
12. Role-Responsibility	.14	.20**	.17*	.17*	.27**	.19**	.23**
13. Physical Environ	.39**	.34**	.33**	.34**	.46**	.24**	.42**
14. Composite Pers Desir	.37**	.38**	.31**	.34**	.48**	.25**	.42**
Stressor Valence							
15. Role-Ambiguity	.17*	.11	.02	.11	.11	.08	.12
16. Role-Boundary	.16*	.12	.05	.10	.17*	.10	.14*
17. Role-Insufficiency	.09	.07	.09	.10	.08	.07	.10
18. Role-Overload	.20**	.01	.04	.09	.08	.14*	.11
19. Role-Responsibility	.24**	.09	.06	.13	.03	.01	.10
20. Physical Environ	.35**	.21**	.21**	.27**	.22**	.30**	.31**
21. Composite Valence	.30**	.15*	.11	.19**	.16*	.17*	.21**
Stressor Expectancy							
22. Role-Ambiguity	.25**	.33**	.28**	.29**	.29**	.24**	.32**
23. Role-Boundary	.21**	.40**	.34**	.28**	.35**	.21**	.35**
24. Role-Insufficiency	.20**	.31**	.33**	.37**	.33**	.22**	.34**
25. Role-Overload	.38**	.35**	.28**	.36**	.35**	.25**	.38**
26. Role-Responsibility	.23**	.32**	.26**	.28**	.22**	.22**	.29**
27. Physical Environ	.41**	.37**	.30**	.39**	.34**	.34**	.42**
28. Composite Expectancy	.38**	.48**	.41**	.45**	.43**	.33**	.48**
Personal Belief							
29. Social Support Demands	.28**	.27**	.27**	.24**	.17*	.35**	.31**
Expectancy							
30. Psychological Stress	.38**	.25**	.29**	.31**	.32**	.35**	.37**
Coping							
31. Recreational	-.34**	-.23**	-.24**	-.25**	-.24**	-.34**	-.32**
32. Physical	-.32**	-.24**	-.18*	-.28**	-.27**	-.11	-.27**
33. Social Support	-.08	-.17*	-.20**	-.20**	-.14*	-.23**	-.21**
34. Rational/Cognitive	-.18**	-.15*	-.12	-.19**	-.18**	-.08	-.18**
35. Composite Coping	-.35**	-.31**	-.29**	-.35**	-.31**	-.29**	-.37**
Hardiness							
36. Control	-.16*	-.13	-.18**	-.20**	-.17*	-.15*	-.20**
37. Commitment	-.26**	-.18**	-.22**	-.28**	-.19**	-.21**	-.26**
38. Challenge	-.29**	-.26**	-.25**	-.24**	-.18**	-.27**	-.29**
39. Hardiness	-.32**	-.27**	-.29**	-.34**	-.25**	-.29**	-.35**
Strain							
40. Physical	.46**	.39**	.35**	.40**	.38**	.36**	.46**
41. Psychological	.38**	.29**	.33**	.36**	.26**	.43**	.40**
42. Composite Strain	.46**	.38**	.37**	.42**	.37**	.41**	.47**

Note: n = 205; *p ≤ .05, **p ≤ .01 (Two-Tail)

With the exception of the low correlations with the Physical Environment scale, the correlations between the OSI stressor and valence scales are generally not significant. Similarly, those with the Composite Valence scale and those between the Valence scales and the Composite OSI scale are generally not significant. As such, on the basis of these correlations, the OSI and valence scales may be seen as essentially independent in nature.

Stressor Expectancy and Personal Belief

Although generally low, correlations between the OSI stressor and stressor expectancy scales are all significant and range from a minimum of 0.20** to a maximum of 0.41** for the correlation between the Intrinsic to Job and Physical Environment scales. In addition, correlations between the OSI stressor scales and Composite Expectancy scale are all significant and range from 0.33** to a maximum of 0.48** between the Managerial Role and Composite Expectancy scales. Similarly, those between the stressor expectancy scales and Composite OSI scale are all significant and range from a minimum of 0.29** to a maximum of 0.48** between the Composite OSI and Composite Expectancy scales. Consequently, on the basis of these correlations, they indicate support for the conceptual independence of the OSI and stressor expectancy scales.

Similarly, correlations between the OSI stressor and Belief Social Support scales are all significant and range from a low 0.17* to a maximum of 0.35** with the Home/Work scale. Further, those with the Expectancy Psychological Stress scale are all significant and range for a minimum of 0.25** to a maximum of 0.38** with the Intrinsic to Job scale. Hence, it is reasonable to conclude that (a) the OSI and Belief scales and (b) the OSI and Expectancy Strain scales are conceptually independent measures of the respective constructs.

Coping and Hardiness

Correlations between the OSI stressor and Coping scales are negative and generally significant. The significant correlations range from a minimum of -0.15* to a maximum of -0.34** with the Recreational Coping scale. Further, those with the Composite Coping scale range from -0.29** to a maximum of -0.35**; and those between the Coping scales and Composite OSI scale from a minimum of -0.18* to a maximum of 0.37** between the Composite OSI and Composite Coping scales. In other words, the data indicates an inverse relationship between the recognition of common stressors and strategies for coping. Further, they indicate support for the conceptual independence of the OSI Stressor and Coping scales.

Although low, relationships between the OSI stressor and hardiness scales (i.e., Control, Commitment, Challenge and Hardiness scales) are negative and generally significant; the significant correlations ranging from a minimum of -0.15* to a maximum of -0.34** between the OSI Career and Hardiness scales. In addition, correlations between the hardiness Scales and the Composite OSI scale range from -0.20** to a maximum of -0.35 with the Hardiness scale. As such, the correlations indicate a significant inverse relationship between sources of stress and dispositions for hardiness. Furthermore, they suggest the relative independence of the OSI Stressor and hardiness constructs.

Factor Analysis of OSI Scales

Given the evidence of a high conceptual overlap or general redundancy within the OSI scales and the uni-dimensional nature of the Composite OSI scale, there is evidence that the latent structure of the OSI scales may in effect reduce to a common dimension.

However, due to a low case/variable ratio for the 61 items in the OSI scale (i.e., 3.36:1), it was unlikely that a factor analysis of the OSI items would produce a stable factor solution, that is, discriminate independent factors (Smith et al., 1993).

Therefore, to further explore this issue, the unrotated solution from a factor analysis of the OSI scales was used to identify the independence of the OSI scales. Table 3.3.5.3 shows the factor loadings for the unrotated solution, eigen values and cumulative variance explained by each factor. As the table shows, the eigen values indicate that a single factor may best represent the latent structure of the OSI scales. Further, each OSI scale loads highly on the first factor which explains 71.5% of the variance between the scales. In addition, the factor cross loadings are either low or substantially lower than the factor loadings on factor one and indicates that a singe factor best represents the latent structure of the OSI scales. Thus, in subsequent analyses, the Composite OSI scale was used to represent the conceptual focus of the individual OSI scales.

Table 3.3.5.3
Factor Analysis - Principal Components Extraction: OSI Common Stressor Scales

Unrotated Solution	Factor Matrix Loadings*					
OSI Scales	Fact 1	Fact 2	Fact 3	Fact 4	Fact 5	Fact 6
Career	.8815			.3017	.3262	
Relationships	.8802		-.2778		-.2330	.3036
Managerial Role	-.8762	.2207		-.2358	.2390	.2657
Structure & Climate	-.8552	.2337	.2131	.3363		
Intrinsic to Job	.8235		.5279			
Home/Work	.7506	.6458				
Eigen Values	4.2926	0.5281	0.4065	0.2937	0.2553	0.2239
Cumulative Variance	71.5%	80.3%	87.1%	92.0%	96.3%	100.0%

Note: n = 205; *Factor loadings 0.2 or greater shown; KMO = 0.9098; Bartlett Test of Sphericity = 838.6822, p .0000.

3.3.5.4.3.2 Personal Desirability Scale Correlations

Although low, correlations between the personal desirability and strain scales are all significant and range from a minimum of 0.15* to a maximum of 0.30** between the Role-Ambiguity and Composite Strain scales (see Table 3.3.5.4). In addition, the Composite Personal Desirability scale correlates 0.31** with the Composite Strain scale and indicates that the strength of the relationship explains 9.61% of the variance in the Composite Strain scale.

Correlations between the personal desirability scales are generally moderate and range from a minimum of 0.35** to maximum of 0.62**. Furthermore, as none the correlations is ≥ 0.70 (Tabachnick & Fidell, 1989) it can be concluded that the scales are essentially independent measures of personal desirability. Further, the correlations between the personal desirability scales and the Composite Personal Desirability scale are generally high and range from a minimum of 0.66** to a maximum of 0.82** with the Physical Environment scale. As such, they indicate that the composite scale may be used as a generic measure of the personal desirability of common study stressors.

Valence, Expectancy, Belief and Expectancy Strain Scales

With the exception of those with the Valence Physical Environment scale, correlations between the personal desirability and valence scales are in the main not significant. By contrast, although rather low, correlations with the Composite Valence scale and similarly those between the valence scales and the Composite Personal Desirability scale are generally significant. Those significant ranging from a minimum of 0.15* to a maximum of 0.24** between the Personal Desirability Physical Environment and Composite Valence scales. That is, the correlations indicate support for the conceptual independence of the personal desirability and valence scales.

Table 3.3.5.4
Correlations: Personal Desirability Scales With Valence, Expectancy, Belief Social Support, Expectancy Psychological Stress, Coping, Hardiness and Strain Scales

Scale	1	2	3	4	5	6	7
Personal Desirability							
1. Role-Ambiguity	----						
2. Role-Boundary	.49**	----					
3. Role-Insufficiency	.55**	.49**	----				
4. Role-Overload	.45**	.35**	.38**	----			
5. Role-Responsibility	.37**	.57**	.45**	.35**	----		
6. Physical Environment	.55**	.58**	.62**	.48**	.48**	----	
7. Composite Pers Desir	.77**	.76**	.79**	.66**	.71**	.82**	----
Stressor Valence							
8. Role-Ambiguity	.07	.16*	.11	.09	.09	.17*	.15*
9. Role-Boundary	.01	.23**	.12	.07	.16*	.16*	.16*
10. Role-Insufficiency	-.01	.15*	.14*	.09	.14*	.15*	.14*
12. Role-Overload	.01	.03	.07	.09	.02	.12	.07
13. Role-Responsibility	.09	.15*	.17*	.20**	.13	.15*	.20**
14. Physical Environment	.07	.12	.22**	.14	.16*	.23**	.21**
15. Composite Valence	.06	.20**	.20**	.17*	.17*	.24**	.23**
Stressor Expectancy							
16. Role-Ambiguity	.12	.03	.18*	-.10	.05	.10	.09
17. Role-Boundary	.02	.09	.00	-.07	-.00	.04	.02
18. Role-Insufficiency	.13	-.01	.16*	.02	.09	.04	.11
19. Role-Overload	.18**	.03	.20**	.09	.09	.18*	.18*
20. Role-Responsibility	.07	.07	.07	.02	.07	-.02	.07
21. Physical Environ	.10	.04	.20**	.04	.06	.18**	.14
22. Composite Expectancy	.14*	.06	.18**	.01	.08	.11	.13
Personal Belief							
23. Social Support Demands	.13	.12	.25**	.11	.26**	.19**	.24**
Expectancy							
34. Psychological Stress	.20**	.18	.21**	.18**	.15*	.29**	.27**
Coping							
25. Recreational	-.13	-.21**	-.11	-.15*	-.14*	-.21**	-.21**
26. Physical	-.13	-.14	-.14	-.06	-.01	-.27**	-.17*
27. Social Support	-.07	-.11	-.09	-.02	-.14*	-.20**	-.14*
28. Rational/Cognitive	-.12	-.18*	-.07	-.15*	-.08	-.15*	-.16*
29. Composite Coping	-.16*	-.23**	-.15*	-.14*	-.13	-.31**	-.25**
Hardiness							
30. Control	-.09	-.13	-.12	-.07	-.15*	-.15*	-.16*
31. Commitment	-.08	-.14*	-.15*	-.20**	-.11	-.21**	-.20**
32. Challenge	-.19**	-.12	-.11	-.06	-.11	-.16*	-.17*
33. Hardiness	-.16*	-.19**	-.16*	-.16*	-.16*	-.23**	-.23**
Strain							
34. Physical	.29**	.20**	.26**	.16*	.15*	.24**	.29**
35. Psychological	.24**	.23**	.22**	.20**	.15*	.24**	.29**
36. Composite Strain	.30**	.23**	.26**	.19**	.17*	.26**	.31**

Note: n = 205; *p ≤ .05, **p ≤ .01 (Two-Tail)

Similarly, the correlation between the personal desirability and stressor expectancy scales are generally not significant. In addition, those with the Composite Expectancy scale and those between the stressor expectancy scales and the Composite Personal Desirability scale are in the main not significant. As such, they suggest support for the conceptual independence of the personal desirability and stressor expectancy scales. Furthermore, taken together, they suggest a low correspondence between the more specific (i.e., valence and expectancy) and more general (i.e., personal desirability) appraisal processes. Indeed, on the basis of these correlations, there is no support for the view expressed in previous studies that valence and expectancy appraisal processes underpin or fuse to form the spectrum of personal desirability appraisal processes.

Correlations between the personal desirability scales and Belief Social Support scale and likewise those between the personal desirability scales and the Expectancy Psychological Stress scale are either low or not significant. The significant correlations with the Belief Social Support scale ranging from 0.19** to a maximum of 0.25** with the Role-Insufficiency scale; and those with Expectancy Psychological Stress scale from a low 0.15* to a maximum of 0.29** with the Physical Environment scale. As result, they indicate support for the conceptual independence of (a) the personal desirability scales and Belief Social Support scale and (b) the personal desirability scales and the Expectancy Psychological Stress scale.

Coping and Hardiness Scales

With the exception of the low and negative correlations between the Personal Desirability Physical Environment scale and each coping scale, the correlations are both negative and generally not significant. In contrast, although low, those with the Composite Coping scale are generally significant and likewise those between the coping

scales and the Composite Personal Desirability scale are all significant. The significant negative correlations ranging from a low -0.14* to a maximum of -0.31 between the Personal Desirability Physical Environment and Composite Coping scales. In other words, they suggest (a) support for the conceptual independence of the personal desirability and coping scales; and (b) although rather weak, an inverse relationship between the personal desirability of common stressors and coping strategies.

Furthermore, with the exception of those related to the Personal Desirability Physical Environment scale, the correlations between the personal desirability and the hardiness sub-scales (i.e., Control, Commitment and Challenge scales) are both negative and generally not significant. In contrast, although rather low and negative, those with the general Hardiness scale and those between the hardiness scales and the Composite Personal Desirability scale are all significant. They range from a low -0.16* to a maximum of -0.23** between the Physical Environment and Hardiness scales and a similar -0.23** between the Composite Personal Desirability and Hardiness scales. That is, they indicate an inverse but weak relationship between the personal desirability of common stressors and dispositions for hardiness; furthermore, they show support for the independence of the personal desirability and hardiness constructs.

3.3.5.4.3.3 Stressor Valence Scale Correlations

With the exception of the low but significant correlations between the Valence Physical Environment and Strain scales, the correlations between the stressor valence and strain scales are not significant (see Table 3.3.5.5). The Composite Valence scale, however, correlates a low 0.18* with Physical Strain scale; a weaker 0.16* with Psychological Strain scale; and 0.18* with the Composite Strain scale. Further, correlations between

Table 3.3.5.5
Correlations: Valence Scales With Expectancy, Belief Social Support, Expectancy Psychological Strain, Coping, Hardiness and Strain Scales

Scale	1	2	3	4	5	6	7
Stressor Valence							
1. Role-Ambiguity	----						
2. Role-Boundary	.68**	----					
3. Role-Insufficiency	.50**	.47**	----				
4. Role-Overload	.57**	.45**	.33**	----			
5. Role-Responsibility	.24**	.26**	.31**	.14*	----		
6. Physical Environment	.24**	.30**	.23**	.23**	.33**	----	
7. Composite Valence	.79**	.77**	.69**	.69**	.57**	.56**	----
Stressor Expectancy							
8. Role-Ambiguity	.24**	.21**	.18**	.18**	.07	.13	.25**
9. Role-Boundary	.22**	.36**	.15*	.09	.10	.01	.23**
10. Role-Insufficiency	.14	.18*	.31**	.04	.14*	.04	.20**
11. Role-Overload	.25**	.19**	.17*	.34**	.09	.24**	.31**
12. Role-Responsibility	.13	.20**	.10	.04	.23**	.04	.18**
13. Physical Environ	.12	.10	.07	.13	.14	.40**	.23**
14. Composite Expectancy	.25**	.29**	.23**	.17*	.19**	.19**	.32**
Personal Belief							
15. Social Support Demands	-.11	-.00	-.06	-.13	.03	.18**	-.03
Expectancy							
16. Psychological Stress	.26**	.26**	.18**	.21**	.22**	.29**	.35**
Coping							
17. Recreational	-.09	-.06	-.06	-.11	-.16*	-.19**	-.17*
18. Physical	-.08	-.08	-.01	-.09	-.19**	-.13	-.14*
20. Social Support	-.07	-.02	-.12	.06	-.03	-.10	-.06
21. Rational/Cognitive	-.01	-.09	-.04	-.02	-.08	-.15*	-.09
22. Composite Coping	-.10	-.08	-.08	-.06	-.19**	-.21**	-.18*
Hardiness							
23. Control	-.01	-.05	-.06	.01	-.10	-.14	-.08
24. Commitment	-.08	-.08	-.07	-.06	-.11	-.20**	-.14*
25. Challenge	.03	.01	.00	-.07	.08	-.15*	-.02
26. Hardiness	-.04	-.05	-.07	-.07	-.06	-.21**	-.12
Strain							
27. Physical	.08	.13	.07	.15*	.10	.19**	.18*
28. Psychological	.10	.11	.09	.08	.06	.21**	.16*
29. Composite Strain	.08	.12	.08	.12	.10	.22**	.18*

Note: n = 205; *p ≤ .05, **p ≤ .01 (Two-Tail).

the valence scales are all significant and range from a low 0.14* to a maximum of 0.68** between the ambiguity and boundary scales. However, the interscale correlations are all ≤ 0.70 and indicates the valence scales are relatively independent in nature. In addition, the correlations with the Composite Valence scale range from moderate to high. They range from a moderate 0.56** with the Physical Environment scale to a

high 0.79** with the Role-Ambiguity scale and indicate that the Composite Valence scale may be used as a uni-dimensional measure of the personal valence assigned to common stressors.

Expectancy, Belief Social Support and Expectancy Psychological Stress Scales

Correlations between the stressor valence and stressor expectancy scales are generally low or not significant. Conversely, those between parallel valence and expectancy scales are all significant and range from 0.24** for the correlation between the role-ambiguity scales to a maximum of 0.40** between the physical environment scales.

Furthermore, although rather weak, correlations between the valence scales and the Composite Expectancy scale are all significant; and similarly those between the expectancy scales and the Composite Valence scale are all significant. For instance, the Composite Valence scale Correlates 0.32** with the Composite Expectancy scale. In other words, the correlations indicate (a) a low conceptual overlap or fusion of parallel valence and expectancy appraisal processes and (b) support for the conceptual independence of the valence and expectancy scales.

With the exception of the low 0.18* correlation with the Physical Environment scale, the correlations between the valence scales and the Belief Social Support scale are not significant. In contrast, those with the Expectancy Psychological Stress scale are all significant and range from a low 0.18* to a much higher 0.35** with the Composite Valence scale.

Hence, the data once again indicates the weak but significant overlap or linkage between valence and expectancy appraisal processes. Furthermore, it shows that (a) the valence scales and Belief Social Support scale and (b) the valence scales and Expectancy Psychological Stress scale are reasonably independent in nature.

Coping and Hardiness Scales

Correlations between the valence and coping scales are in the main not significant and further reflects in the weak correlation between the Composite Valence and Composite Coping scales (i.e., -0.18*). As a result, it indicates support for the conceptual independence of the valence and coping constructs. Similarly, the correlations between the valence and hardiness scales are mainly not significant. Further, they indicate support for the conceptual independence of valence and hardiness cognitive processes.

3.3.5.4.3.4 Stressor Expectancy, Belief, Coping and Hardiness Scale Correlations

With the exception of those for the Expectancy Role-Ambiguity and Role-Boundary scales, the correlations between the stressor expectancy and strain scales are significant (see Table 3.3.5.6). For instance, those with the Composite Stain scale range from a low 0.16* to maximum of 0.33** with the Expectancy Physical Environment scale. Further, those between the Composite Expectancy scale and strain scales are all significant and range from a slightly lower 0.26** to a maximum of 0.27** with the Composite Strain scale.

The correlations between the Expectancy scales are all significant and range from a low 0.23** to a moderate 0.59** between the Role-Ambiguity and Role-Overload scales. Further, as the correlations are all ≤ 0.70 it can be concluded that the Expectancy scales are relatively independent in nature. In addition. the correlations with the Composite Expectancy scale are generally high and range from a minimum of 0.61** to a maximum of 0.76** for the Role-Ambiguity and Role-Insufficiency scales. Therefore, it is reasonable to conclude that the Composite Expectancy scale may be seen as uni-dimensional measure of the expectancies assigned to common stressors.

Furthermore, correlations between the stressor expectancy scales and Belief Social Support scale are either low or not significant. As such, they suggest the conceptual independence of the stressor expectancy scales and Belief Social Support scale. In contrast, although low, those with the Expectancy Psychological Stress scale are all significant and thereby indicate a rather low conceptual overlap of the expectancy scales. However, as the interscale correlations are low, they indicate support for the conceptual independence of the stressor expectancy scales and Expectancy Psychological Stress scale.

Correlations between the stressor expectancy and coping scales are mainly not significant; and similarly those with the hardiness scales are generally not significant. Thus, contrary to the significant correlations between the expectancy scales and strain, there is seemingly a weak correspondence between the expectancies assigned to common stressors and (a) the use of coping strategies to reduce or counteract stress and (b) the effect of dispositions for hardiness on symptoms of strain.

Personal Belief and Expectancy Psychological Stress Correlations

Although significant, the correlation between the Belief Social Support and Expectancy Psychological Stress scales is low (i.e., r = 0.21**); furthermore, it indicates support for the conceptual independence of these scales. Further, the correlations between the Belief Social Support scale and coping scales and similarly those with the hardiness scales are either low or not significant. In contrast, although low, the correlations between the Belief Social Support scale and strain scales are significant and range from a minimum of 0.26** for physical strain to a higher 0.32** with both psychological and composite symptoms of strain.

Correlations between the Expectancy Psychological Stress scale and coping scales are both negative and mainly significant. Those significant range from a low -0.18* to a maximum of 0.30** with the Composite Coping scale. Similarly, although low, those with the hardiness scales are negative and significant. They range from a low -0.16* to a maximum of -0.24** with the Hardiness scale. Therefore, on the basis of these correlations, there is no substantive evidence to indicate that the Expectancy Psychological Stress scale and hardiness scales are in essence convergent measures of personal resilience. Indeed, contrary to the expected convergence or construct validity of these constructs, the correlations indicate support for the conceptual independence of the scales. In sharp contrast, the correlations between the Expectancy Psychological Stress scale and dimensions of strain are moderate and range from 0.44** with symptoms of psychological strain to a maximum of 0.51** with the Composite Strain scale.

Coping and Hardiness

Correlations between the coping and strain scales are negative and all significant. For instance, those with the Composite Strain scale range from a minimum of -0.29** with Social Support coping to a maximum of -0.39 with Physical (i.e., self-care) coping. In addition, the Composite Coping scale correlates a moderate -0.46** with Physical Strain; a similar -0.46** with Psychological Strain; and a slightly higher -0.51** with the Composite Strain scale. Further, due to the significant inverse relationships with strain, they suggest that increases in the use of coping is related to a reduction in symptoms of strain.

Table 3.3.5.6
Correlations: Stressor Expectancy, Belief Social Support, Expectancy Psychological Stress, Coping and Hardiness With Strain

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Stressor Expectancy																				
1. Role-Ambiguity	----																			
2. Role-Boundary	.56**	----																		
3. Role-Insufficiency	.47**	.55**	----																	
4. Role-Overload	.59**	.31**	.42**	----																
5. Role-Responsib	.38**	.44**	.46**	.34**	----															
6. Physical Environ	.35**	.23**	.32**	.50**	.33**	----														
7. Composite Stressor	.76**	.73**	.76**	.70**	.72**	.61**	----													
Personal Belief																				
8. Soc Supp Demands	.15*	.10	.17*	.12	.21**	.26**	.23**	----												
Expectancy																				
9. Psychological Stress	.18**	.19**	.23**	.29**	.15*	.29**	.29**	.21**	----											
Coping																				
10. Recreational	-.20**	-.17*	-.07	-.20**	-.16*	-.40**	-.27**	-.16*	-.26**	----										
11. Physical	.01	-.03	.00	-.09	-.03	-.14	-.06	.07	-.27**	.37**	----									
12. Social Support	.01	.01	-.02	-.02	-.06	-.14	-.05	-.19**	-.10	.30**	.21**	----								
13. Rational/Cognitive	.02	.05	.07	-.00	.14*	-.02	-.06	-.03	-.18**	.08**	.33**	.20**	----							
14. Composite Coping	-.06	-.06	-.01	-.11	-.08	-.28**	-.13	-.12	-.30**	.70**	.75**	.65**	.51**	----						
Hardiness																				
15. Control	.05	.02	-.04	-.02	-.04	-.21**	-.06	-.13	-.16*	.30**	.32**	.42**	.39**	.52**	----					
16. Commitment	.06	.08	.10	-.04	-.03	-.20**	-.01	-.13	-.23**	.24**	.36**	.36**	.41**	.50**	.63**	----				
17. Challenge	-.08	-.08	-.03	-.24**	-.09	-.26**	-.17*	-.20**	-.20**	.27**	.14*	.16*	.09	.25**	.15*	.35**	----			
18. Hardiness	-.01	.01	.03	-.12	-.06	-.28**	-.09	-.20**	-.24**	.36**	.38**	.43**	.43**	.58**	.75**	.89**	.61**	----		
Strain																				
19. Physical	.12	.16*	.14*	.28**	.18**	.30**	.26**	.26**	.47**	-.31**	-.40**	-.25**	-.28**	-.46**	-.42**	-.47**	-.32**	-.50**	----	
20. Psychological	.13	.05	.15*	.21**	.19**	.31**	.24**	.32**	.44**	-.42**	-.25**	-.30**	-.26**	-.46**	-.35**	-.45**	-.37**	-.52**	.61**	---
21. Composite Strain	.13	.12	.16*	.29**	.19**	.33**	.27**	.32**	.51**	-.37**	-.39**	-.29**	-.31**	-.51**	-.44**	-.51**	-.36**	-.56**	.94**	.83**

Note: n = 205; *p ≤ .05, **p ≤ .01 (Two-Tail); Comp: Composite Scale From Sum of Sub-Scales

Correlations between the coping scales are low and mainly significant. As such, the coping scales may be seen as essentially independent measures of coping. By contrast, correlations between the Composite Coping scale and the coping scales range from moderate to strong. The use of recreational and physical coping correlate a high 0.70** and 0.75** with the Composite scale; the use of Social Support coping, a moderate 0.65** with the Composite scale; and the use of Rational/Cognitive coping, a weaker 0.51** with the Composite Coping scale. Thus, on the basis of these correlations, the Composite Coping scale may not be seen as a valid substitute for the coping sub-scales or uni-dimensional measure of coping strategies.

With one exception, the correlations between the coping and hardiness sub-scales (i.e., Control, Commitment and Challenge scales) are all significant and range from low 0.14* to a moderate 0.41** between the Rational/Cognitive and Commitment scales. Those with the Hardiness scale, however, tend to be moderate and range from a minimum of 0.36** to a maximum of 0.43** with both the Social Support and Rational/Cognitive coping scales. In addition, those between the Composite Coping scale and hardiness scales are generally moderate and range from a low 0.25** with the Challenge scale to a moderate 0.58** with the more generic Hardiness scale. Further, these moderate correlations suggest that a high use of coping is related to high personal hardiness; conversely, that a low use of coping corresponds to low personal hardiness. In other words, the data implies that low hardiness is seemingly related to high symptoms of strain. Thus, taken together, the correlations indicate a low to moderate overlap of the Coping and Hardiness scales. As such, they may be seen as essentially independent measures of the respective constructs.

Correlations between the hardiness and strain scales are both negative and primarily moderate. Those with the Control, Commitment and Challenge scales range from a minimum of -0.32** for the correlation between the Challenge and Physical Strain scales to a maximum of -.0.51** for the correlation between the Commitment and Composite Strain scales. By contrast, those between the Hardiness scale and strain scales are much stronger and range from a moderate -0.50** for the correlation with the Physical Strain scale to a much stronger -0.56** for the correlation between the Hardiness and Composite Strain scales. Furthermore, they indicate an inverse relationship between the hardiness and strain scales which suggests that increases in hardiness (i.e., hardy cognitive styles) relate to low symptoms of strain.

Correlations between the hardiness scales range from low 0.15* to a moderate 0.63** between the Control and Commitment scales. Further, due to the moderate overlap of the Control and Commitment scales and the low correspondence of these scales with the Challenge scale, there is the inference that a two factor structure may best represent the items in the Hardiness scale. In addition, correlations with the Hardiness scale range from a moderate 0.61** with the Challenge scale to high 0.89** with the Control scale. As such, they indicate that the Hardiness scale may be used as generic or unidimen-sional measure of dispositions for hardiness.

3.3.5.4.3.5 Item Analysis: Expectancy Psychological Stress Scale

Given the moderate correlations between expectancies for psychological stress and measures of strain, and the underlying conceptual basis of the items used in the Expectancy Psychological Stress scale, there arises the possibility that a semantic overlap of the expectancy and psychological strain items may well inflate the correlation between the constructs. That is, it is possible that the moderate correlations with strain may well be an artefact of the methodology. As previously discussed in chapter four (see chapter

3.2.4.4.3 and Table 3.2.4.6), a qualitative item analysis of the scale items argued that the items in the Expectancy Psychological Stress scale are, to a limited extent, similar to those used in the Psychological Strain scale. In addition, a quantitative item analysis concluded that there was no evidence of an exaggerated correspondence between the corresponding expectancy and psychological strain items. Thus, considering the possible effect on the validity of the findings for the present study, there is a need to further explore this issue.

Table 3.3.5.7 shows the correlations between the items used in Expectancy Psychological Stress scale and measures of strain. In addition, the table shows the correspondence between parallel items in the Expectancy Psychological Stress and Psychological Strain scales.

Table 3.3.5.7
Item Correlations: Expectancy Psychological Stress Scale Items With Strain Scales and Psychological Strain Scale Items

Variable	Expectancy Psychological Stress				
	Var 212 (Irritable)	Var 213 (Depressed	Var 214 (Sleep)	Var 215 (Complain)	Var 216 (Worried)
Strain Scales					
1. Physical	.28**	.40**	.40**	.21**	.33**
2. Psychological	.26**	.35**	.37**	.20**	.32**
3. Strain Composite	.31**	.42**	.43**	.23**	.36**
Psychological Stress Items					
4. Var 93 (Irritated)	.32**	.40**	.39**	.11	.25**
5. Var 94 (Depressed)	.21**	.27**	.31**	.16*	.26**
6. Var 97 (Falling Asleep)	.09	.25**	.27**	.17*	.27**
7. Var 99 (Complaining)	.33**	.29**	.29**	.17*	.35**
8. Var 100 (Worrying)	.19**	.24**	.28**	.14	.27**

Note: n = 205; *p. ≤ .05, **p. ≤ .01 (Two-Tail)

Correlations between the expectancy items and strain are all below the correlations for the Expectancy Scale with Physical (i.e., r = 0.47**), Psychological (i.e., r = 0.44**) and Composite Strain (i.e., r = 0.51**) scales. In particular, those with the Psychological Strain scale are the weakest for each item. Furthermore, the correlations for the parallel items in the Expectancy Psychological Stress and Psychological Strain scales are either equal or below the highest inter-item correlation.

Therefore, on the basis of these correlations, there is no evidence of any inflated item-strain or parallel item-item correlations. Consequently, it may be concluded that the moderate correlations between expectancies for psychological stress and symptoms of strain are not an artefact of the methodology or carry-over effect from the semantic similarity of parallel expectancy-strain items

3.3.5.4.3.6 Comparison of Original and Transformed Scales

Table 3.3.5.8 compares the correlations between the original and transformed OSI common stressor, personal desirability, valence, expectancy, coping and hardiness scales (see Appendix G.1.1.1, Table G.1 & Appendix G.1.1.2, Table G.3) with the Physical, Psychological and Composite Strain scales. As the table shows, the transformation of skewed distributions does not necessarily increase the correlations with strain; or at best, may only slightly increase the correlations with strain. Furthermore, as indicated by the correlations, the effect of data transformations on the distribution of data, may in some cases reverse the direction of correlations.

For instance, the transformation of the OSI Managerial and Structure/Climate scales has little effect on the strength of the correlations with strain; further, in each case, the effect of transformation reverses the direction of the correlation. Similarly, although transformation of the Hardiness scale has no apparent effect on the correlations with

strain, it does nonetheless reverse the direction of the correlation from positive to negative. In contrast, transformations of the personal desirability scales tend to slightly increase the correlations with the Physical, Psychological and Composite Strain scales.

Table 3.3.5.8
Correlations: Original and Transformed Scales - OSI Stressor, Personal Desirability, Stressor Valence, Stessor Expectancy, Expectancy Psychological Strain, Coping and Hardiness With Strain

Transformed Scale	Strain					
	Physical		Psychological		Composite	
	Original#	Trans#	Original#	Trans#	Original#	Trans#
OSI Stressor						
1. Managerial	.39**	-.38**	.29**	-.29**	.38**	-.38**
2. Structure/Climate	.38**	-.38**	.26**	-.26**	.37**	-.36**
Personal Desirability						
3. Role-Ambiguity	.29**	.30**	.25**	.25**	.30**	.32**
4. Role-Boundary	.20**	.24**	.23**	.26**	.23**	.27**
5. Role-Insufficiency	.26**	.28**	.22**	.22**	.26**	.28**
6. Role-Overload	.16*	.16*	.20**	.21**	.19**	.19**
7. Role-Responsibility	.15*	-.16*	.15*	-.14*	.17*	-.17*
8. Physical Environ	.24**	.25**	.24**	.23**	.26**	.26**
9. Comp Person Desir	.29**	.31**	.29**	.28**	.31**	.32**
Stressor Valence						
10. Role-Ambiguity	.08	-.06	.10	-.08	.08	-.06
11. Role-Boundary	.13	-.11	.11	-.09	.12	-.11
12. Role-Insufficiency	.07	-.08	.10	-.10	.08	-.09
13. Role-Overload	.15*	-.11	.08	-.02	.12	-.07
14. Physical Environ	.19**	-.20**	.22**	-.21**	.22**	-.22**
15. Composite Valence	.18*	-.18*	.16*	-.15*	.18*	-.18*
Stressor Expectancy						
16. Role-Ambiguity	.12	-.06	.13	-.10	.13	-.08
17. Role-Boundary	.16*	-.14	.05	-.05	.12	-.11
18. Role-Insufficiency	.14*	-.14*	.15*	-.14*	.16*	-.15*
19. Role-Overload	.28**	.27**	.22**	.23**	.29**	.29**
20. Role-Responsibility	.18**	-.17*	.19**	-.18**	.19**	-.18**
21. Physical Environ	.30**	-.32**	.31**	-.32**	.33**	-.34**
22. Composite Expect	.26**	-.24**	.24**	-.22**	.27**	-.25**
Expectancy						
23. Expect Psych Stress	.47**	-.47**	.44**	-.44**	.51**	-.51**
Coping						
24. Physical	-.40**	-.39**	-.25**	-.24**	-.39**	-.38**
25. Social Support	-.25**	.20**	-.30**	.30**	-.29**	.25**
Hardiness						
26. Hardiness	-.50**	.50**	-.52**	.52**	-.56**	.55**

Note: n = 205; *p ≤ .05, **p ≤ .01 (two-tail); #Original/Trans - Original and Transformed Scales

For instance, those for the Role-Boundary scale increase from 0.20** to 0.24** with the Physical Strain; from 0.23** to 0.26** with Psychological Strain; and from 0.23** to 0.27** with the composite measure of strain. On the other hand, for example, transformation of the Physical and Social Support Coping scales tends to have a negative effect on correlations with strain. For instance, those for social support coping reduce from -0.25** to 0.20** for the correlation with physical strain; has no effect on the relationship with psychological strain; and those for the composite strain, reduced from -0.29** to 0.25**.

In summary, the minimal difference between the original and transformed correlations suggest that correlation coefficients computed from skewed response distributions may in effect be more robust than distortions in the overlap of response distributions imply. Then again, the rigour and validity of both nomothetic research and statistical inference (i.e., generalisation) are crucially dependent on the assumption of normality and therefore demands the normalisation of data distributions (Barratt, 1971; Hammond, 1996; Howell, 1992; Stone & Hollenbeck, 1989; Tabachnick & Fidell, 1989).

3.3.5.4.3.7 Personal Desirability Scale: Response Anchor Correlations

Tables 3.3.5.9 to 3.3.5.11 show the correlations related to the "Would Like More" "About Right" and "Would Like Less" anchors of the Personal Desirability scale with the OSI common stressor scales and dimensions of strain. The correlations seek to identify (a) relationships with strain; (b) the degree of independence of the personal desirability scales; and (c) the conceptual independence of the Personal Desirability (i.e., appraisal) and OSI common stressor (i.e., recognition) scales. Table 4.5.17, shows the correlations between the Composite Personal Desirability scales with the hardiness and strain scales.

"Like More" Correlations

With the exception of those for the Role-Responsibility scale, correlations between the "Like More" Evaluative Stressor scales and strain are significant (see Table 3.3.5.9). Those with the Physical Strain scale ranging from a minimum of 0.15* to a maximum of 0.32** with the Role-Insufficiency scale; those with the Psychological Strain scale from a minimum of 0.26** to a maximum of 0.31** with the Role-Insufficiency scale; and those with the composite measure of strain from 0.24** to a maximum of 0.35** with Role-Insufficiency scale (see note Table 3.3.5.9).

Furthermore, correlations between the "Like More" scales are all significant and range from a minimum of 0.26** to a maximum of 0.53** between the ambiguity and overload scales. As a result, the scales may be seen as relatively independent in nature. By contrast, the correlations with the Composite "Like More" scale are generally moderate in nature and range from a minimum 0.53** to a maximum of 0.81** for the correlation with the Role-Ambiguity scale. That is, the scale carries information which relates to each of the desirability scales and therefore may be used as a generic or unidimensional measure of the "Like More" Personal Desirability scales.

Furthermore, although generally significant, correlations between the "Like More" Personal Desirability and OSI common stressor scales tend to be weak. Those significant, range from a minimum of 0.16* to a maximum of -0.45** between the Role-Insufficiency and Structure/Climate scales. Further, although significant, correlations with the Composite OSI scale tend to be weak and range from a low 0.20** to a maximum of 0.37** with Role-Ambiguity scale. In contrast,, the correlations between the Composite Personal Desirability scale and the OSI scales tend to be somewhat stronger

and range from a low 0.28** to a moderate -0.49** with the Structure/Climate scale. As a result, they indicate that the "Like More" Personal Desirability and OSI Common Study Stressor scales are reasonably independent in nature.

Table 3.3.5.9
Correlations: "Would Like More" Personal Desirability Scales With OSI Stressor and Dimensions of Strain Scales

Scale	1	2	3	4	5	6	7
Personal Desirability							
1. Role-Ambiguity	----						
2. Role-Boundary#	.38**	----					
3. Role-Insufficiency	.51**	.26**	----				
4. Role-Overload#	.53**	.27**	.43**	----			
5. Role-Responsibility#	.33**	.28**	.26**	.32**	----		
6. Physical Environment#	.49**	.31**	.48**	.43**	.30**	----	
7. Composite Pers Desir#	.81**	.53**	.78**	.66**	.55**	.71**	----
OSI Stressor							
8. Intrinsic to Job	.33**	.17*	.36**	.14	.05	.28**	.35**
9. Managerial Role#	-.34**	-.24**	-.39**	-.23**	-.17*	-.27**	-.42**
10. Relationships	.29**	.21**	.33**	.23**	.19**	.23**	.37**
11. Career	.31**	.17*	.42**	.22**	.16*	.30**	.42**
12. Structure & Climate#	-.38**	-.25**	-.45**	-.24**	-.26**	-.32**	-.49**
13. Home/Work	.24**	.14	.25**	.21**	.18**	.15*	.28**
14. Composite OSI#	.37**	.23**	.43**	.25**	.20**	.30**	.46**
Strain							
15. Physical	.33**	.15*	.28**	.22**	.12	.22**	.34**
16. Psychological	.27**	.14*	.23**	.23**	-.01	.18**	.25**
17. Composite Strain	.34**	.15*	.28**	.24**	.08	.22**	.33**

Note: n = 205; *p. ≤ .05, **p. ≤ .01 (Two-Tail); (a) # Transformed Scale; (b) Due to the Effect of Transformation, the Direction of Correlations May Be Reversed.

"About Right" Correlations

Although in the main low, the correlations between the "About Right" desirability scales and strain are all significant (see Table 3.3.5.10) and indicate an inverse relationship with each dimension of strain. Those with the Physical Strain scale range from a minimum of -0.16* to a maximum of -0.32** with the Role-Insufficiency scale; those with the Psychological Strain scale, from a minimum of -0.14* to maximum of -0.26**

with the Role-Insufficiency scale; and those with the Composite Strain Scale, from a minimum of -0.17** to a maximum of -0.32** for both the Role-Ambiguity and Role-Insufficiency scales. In addition, correlations between the Composite Personal Desirability scale and strain are reasonably strong and range from a minimum of -0.31** to a maximum of -0.36** with the Composite Strain scale. Furthermore, the inverse correlations between the Personal Desirability scales and strain imply that increases in the appraisal of "About Right" (i.e., satisfaction) with a stressor are related to a reduction in symptoms of strain.

In addition, the correlations between the "About Right" scales are all significant and range from a minimum of 0.25* to a maximum of 0.48** between the Role-Insufficiency and Physical Environment scales. Therefore, on the basis of this data, the scales may be seen as relatively independent measures of personal desirability. Further, correlations with the Composite Personal Desirability scale are all moderate and range from 0.60** with the Role-Overload scale to a maximum of 0.76** with the Physical Environment scale. This indicates that the Composite "About Right" scale may be used as a more general measure of the personal desirability assigned to common stressors.

Although low, correlations between the "About Right" personal desirability and OSI common study stressor scales are generally significant and indicate an inverse relationship between the appraisal of "About Right" (i.e., satisfaction) with stressors and the recognition (i.e., perceived pressure) of common study stressors. The significant correlations range from a minimum of -0.16* to a maximum of 0.42** between the Role-Insufficiency and Structure/Climate scales and a similar -0.42** between the Role-Insufficiency and Composite OSI Scales. In addition, the correlations between the Composite Personal Desirability scale and the OSI scales range from a minimum of

-0.29** to a moderate 0.46** with the Structure/Climate scale. As a result, the "About Right" personal desirability and OSI common study stressor scales may be seen as relatively independent measures of the respective constructs.

Table 3.3.5.10
Correlations: "About Right" Personal Desirability Scales With OSI Common Stressor and Dimensions of Strain Scales

Scale	1	2	3	4	5	6	7
Personal Desirability							
1. Role-Ambiguity#	----						
2. Role-Boundary	.39**	----					
3. Role-Insufficiency#	.43**	.41**	----				
4. Role-Overload	.25**	.30**	.28**	----			
5. Role-Responsibility	.33**	.44**	.34**	.30**	----		
6. Physical Environment	.43**	.43**	.48**	.41**	.40**	----	
7. Composite Pers Desir	.69**	.72**	.70**	.60**	.68**	.76**	----
OSI Stressor							
8. Intrinsic to Job	-.29**	-.20**	-.34**	-.18**	-.09	-.29**	-.34**
9. Managerial Role#	-.30**	.28**	.38**	.20**	.18*	.32**	.41**
10. Relationships	-.25**	-.24**	-.34**	-.13**	-.17*	-.30**	-.35**
11. Career	-.28**	-.18**	-.41**	-.11	-.16*	-.32**	-.36**
12. Structure & Climate#	-.29**	.33**	.42**	.22**	.24**	.37**	.46**
13. Home/Work	-.21**	-.17*	-.26**	-.11**	-.22**	-.21**	-.29**
14. Composite OSI#	-.32**	-.28**	-.42**	-.19**	-.21**	-.37**	-.44**
Strain							
15. Physical	-.30**	-.22**	-.32**	-.17*	-.16*	-.20**	-.33**
16. Psychological	.23**	-.22**	-.26**	-.24**	-.14*	-.21**	-.31**
17. Composite Strain	-.32**	-.24**	-.32**	-.21**	-.17*	-.22**	-.36**

Note: n = 205; *p ≤ .05, **p ≤ .01 (Two-Tail); # Transformed Scale; Due to the Effect of Transformation, the Direction of Correlations May Be Reversed.

"Like Less" Correlations

Although low and with the exception of those for the Role-Ambiguity and Role-Insufficiency scales, correlations between the "Like Less" personal desirability scales and strain are generally significant (see Table 3.3.5.11). For example, the Role-Boundary scale correlates 0.22** with the Composite Strain scale and the Role-

Responsibility scale -0.23** with the Psychological Strain scale (see note Table 3.3.5.11). Further, the Composite Personal Desirability scale correlates 0.16* with Physical Strain; a higher 0.23** with Psychological Strain; and 0.21** with the Composite Strain scale. However, with the exception of those with the Role-Responsibility and Composite Personal Desirability scales, the correlations with strain may in effect be somewhat deflated due to the effect of either or both significant skewness and poor reliability among the "Like Less" scales (see Appendix G.1.1.4, Table G.5)

Although generally low, several correlations between the "Like Less" scales are significant and range from a low 0.16* to a moderate 0.49** between the Role-Boundary and Physical Environment scales. Therefore, on the basis of these correlations, the "Like Less" scales may be seen as relatively independent in nature. By contrast, with one exception, correlations with the Composite Personal Desirability scale are significant and range from a low -0.33** with the Role-Ambiguity scale to a maximum of 0.75** with the Role-Boundary scale. Hence, the composite scale may be seen as essentially a poor reflection of the "Like Less" scales and therefore should not be used as a more general measure of personal desirability.

With the exception of the significant correlations with the Physical Environment scale, the correlations between the "Like Less" personal desirability and OSI common stressor scales are mainly not significant. The significant correlations range from a minimum of 0.16* to a maximum of -0.38** between the Physical Environment and Career scales and a much lower 0.23** between the Composite Personal Desirability and Composite OSI scales. Consequently, the "Like Less" personal desirability and OSI common stressor scales may be seen as essentially independent domains of measurement.

Table 3.3.5.11
Correlations: "Would Like Less" Personal Desirability Scales With OSI Common Stressor and Dimensions of Strain Scales

Scale	1	2	3	4	5	6	7
Evaluative Stressor							
1. Role-Ambiguity#	----						
2. Role-Boundary#	-.28**	----					
3. Role-Insufficiency#	-.10	.09	----				
4. Role-Overload#	-.00	.19**	-.09	----			
5. Role Responsibility#	.19**	-.42**	.01	-.20**	----		
6. Physical Environment#	-.16*	.49**	.01	.20**	-.30**	----	
7. Composite Pers Desir#	-.33**	.75**	-.04	.58**	-.65**	.67**	----
OSI Stressor							
8. Intrinsic to Job	-.03	.15*	-.11	.21**	-.11	.28**	.22**
9. Managerial Role#	.02	-.21**	-.06	-.10	.11	-.27**	-.21**
10. Relationships	.00	.16*	.03	.02	-.10	.28**	.15*
11. Career	-.05	.15*	.03	.01	-.12	.26**	.13
12. Structure & Climate#	-.01	-.30**	-.00	-.13	.10	-.38**	-.28**
13. Home/Work	-.03	.12	-.05	.01	-.18*	.19**	.15*
14. Composite OSI#	-.03	.22**	-.01	.09	-.14*	.34**	.23**
Strain							
15. Physical	-.02	.19**	-.10	.06	-.12	.13	.16*
16. Psychological	-.02	.19**	-.07	.14*	-.23**	.15*	.23**
17. Composite Strain	-.03	.22**	-.08	.10	-.19**	.15*	.21**

Note: n = 205; *p. ≤ .05, **p. ≤ .01 (Two-Tail); (a) # Transformed Scale; (b) Due to the Effect of Transformation, the Direction of Correlations May Be Reversed.

3.3.5.4.3.8 Composite Personal Desirability Scales

Correlations between the composite personal desirability scales are shown in Table 3.3.5.12. In addition, it shows the relationship between the composite personal desirability scales and (a) strain; and (b) dimensions of hardiness.

The correlations between the composite personal desirability scales range from low to essentially multicollinear in nature. In particular, the correlation between the Personal Desirability and "About Right" scales (i.e., -0.91**) is multicollinear and indicates that one of the composite scales is redundant. In addition, the high correlations between the Personal Desirability and "Like More" (i.e., 0.87**) and "Like Less" (i.e., 0.70**) scales; and similarly, that between the "Like More" and "About Right" (i.e., -0 .86**) scales indicate that either of the scales in each correlation is in effect redundant.

By contrast, the low correlation between the "Like More" and "Like Less" Composite Desirability scales (i.e., 0.31**) indicates that these scales are relatively independent measures of personal desirability. In sum, due to the evidence of (a) redundancy between scales and (b) the circularity of the scales, neither of the composite scales should not be used as predictors of strain as the divergent validity of the scales is seemingly poor. That is, given the multicollinear nature of these correlations, it cannot be concluded that the composite personal desirability scales are conceptually independent scales.

Table 3.3.5.12
Correlations: Composite Personal Desirability Scales With Dimensions of Hardiness and Strain

Scale	1	2	3	4
Composite Desirability				
1. Personal Desirability#	----			
2. Would Like More#	.87**	----		
3. About Right	-.91**	-.86**	----	
4. Would Like Less#	.70**	.31**	-.66**	----
Hardiness				
5. Control	-.17*	-.16*	.20**	-.13
6. Commitment	.20**	-.15*	.26**	-.25**
7. Challenge	-.15*	-.16*	.18*	-.09
8. Hardiness#	.23**	.19**	-.29**	.23**
Strain				
5. Physical	.31**	.34**	-.33**	.16*
6. Psychological	.28**	.25**	-.31**	.23**
7. Composite Strain	.32**	.33**	-.36**	.21**

Note: n = 205; *p. ≤ .05, **p. ≤ .01 (Two-Tail); # Transformed Scale; Due to the Effect of Transformation, the Direction of Correlations May Be Reversed.

Although rather low, correlations between the composite personal desirability and hardiness scales are generally significant. For instance, the "About Right" scale correlates 0.26** with the Commitment scale and a slightly higher -0.29** (see note Table

3.3.5.12) with the Hardiness scale. As such, they indicate the conceptual independence of the composite personal desirability and hardiness scales. Further, although shown as positive in the table (i.e., transformation effects on the direction of correlations - see note Table 3.3.5.12), the correlations between the Composite Personal Desirability "Like More" and "Like Less" scales and the Hardiness scale are in effect negative in direction; and that between the "About Right" and Hardiness scale, positive in nature. In other words, the inverse correlations suggest that increases in the desirability of stressors (i.e., the desire for more or less of a stressor) is related to a decrease in personal hardiness; and conversely, that increases in the personal satisfaction with a stressor (i.e., "About Right") is related to an increase in personal hardiness.

3.3.5.4.4 Regression Analyses

Tables 3.3.5.13 to 3.3.5.25 summarise the results from a series of backward and hierarchical modelling regression models which explore the relative effect of common study stressors (i.e., recognition of common stressors), the personal meaning assigned to intrinsic and extrinsic sources of stress, coping strategies and dispositions for hardiness on dimensions of strain. In particular, the analyses sought to identify the models of best fit which best predict physical, psychological and composite symptoms of strain; and from these analyses, test the theoretical importance and identify the incremental effect of significant (a) personal meaning appraisal process and (b) personal desirability appraisal processes when placed in the presence of significant predictors of strain. Following this, the analyses then sought to further explore (a) the effect of low and high hardiness cognitive styles on the explanation of the variance in composite strain; and (b) the effect of "Like More" "About Right" and "Like Less" personal desirability appraisal processes on the explanation of composite strain.

Table 3.3.5.13 presents a summary of the results from baseline regression models which explore the effect of (a) OSI common study stressors; (b) the personal desirability assigned to common study stressors; (c) the valence and expectancy assigned to common study stressors; (d) beliefs associated with the provision of social support; (e) the expectancy assigned to psychological strain; (e) coping strategies; and (f) dispositions for hardiness on composite symptoms of strain. Tables 3.3.5.14 to 3.3.5.17, the results from a series of model building analyses which explore the relative effect of (a) personal meaning appraisal processes; and (b) significant personal meaning appraisal processes when in the presence of significant common study stressor, coping and hardiness cognitive processes on composite strain. Table 3.3.5.18, the results from a model of best fit which sought to identify the most parsimonious explanation for the variance in composite symptoms of strain reported by the sample. Tables 3.3.5.19 and 3.3.5.20, the results from hierarchical modelling which sought to test the principal hypothesis of this thesis and identify the incremental effect of specific and general appraisal processes on composite symptoms of strain. That is, these analysis sought to identify the theoretical importance and incremental effect of significant personal meaning appraisal processes on symptoms of composite strain when placed in the presence of significant hardiness, common study stressor and coping cognitive processes. Following these analyses, Table 3.3.5.21 shows the results from a hierarchical analysis which sought to test the theoretical importance and identify the incremental effect of significant personal desirability predictors of strain on the variance in composite symptoms of strain when placed in the presence of significant predictors of strain. Finally, Tables 3.3.5.22 to 3.3.5.24 show a summary of the results from a series of regression analyses which further explore the effect of low and high hardiness cognitive styles on the explanation of strain; and Table 3.3.5.25, the relative effect of the personal desirability assigned to

stressors in terms of "Like More" "About Right" and "Like Less" on composite symptoms of strain. (Note: results for regression analyses related to physical and psychological strain are shown in Appendix G.2).

For each regression model, an alpha pout at ≥ .051 (Two Tailed) is used to (a) effect the removal of a variable from the regression model or (b) interpret the data in the equations for hierarchical models.

3.3.5.4.4.1 Baseline Analyses

As evident from the results for the baseline models (see Table 3.3.5.13), the recognition of common study stressors, dimensions of personal meaning, coping strategies and dispositions for hardiness each account for a significant percentage of the explained variance in Composite symptoms of strain. For example, even though the OSI stressor dimensions are moderately correlated, the recognition of "intrinsic to the job" and "home/work" common study stressors explain a moderate 24.43% (23.68% adj) of the variance in symptoms of composite strain. By contrast, the uni-dimensional or generic OSI composite scale explains a slightly lower 22.10% (21.72%) of the variance in strain. However, due to the moderate conceptual overlap of the OSI scales, the 61 item OSI composite scale was used to represent "sources of pressure" in subsequent analyses. Furthermore, the more general personal desirability of role-ambiguity stressors, explains a much lower 9.92% (9.47% adj) of the variance in composite strain; the expectancy of physical environment and role-overload stressors, an increased 14.09% (13.24%) of the variance; expectancies for psychological stress, a higher and moderate 26.00% (25.63% adj) of the variance; and the cumulative effect of commitment, control and challenge hardiness cognitive styles, a substantially higher 32.47% (31.47% adj) of the variance in the composite strain.

Table 3.3.5.13
Backward Regression - Baseline Models: Composite Strain on OSI Stressors, Personal Desirability, Valence, Expectancy, Belief Social Support, Expectancy Psychological Stress, Coping and Hardiness

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
OSI Common Stressor	Intrinsic to Job	24.43%	23.68%	0.3285	4.423	.0000
	Home/Work			0.2273	3.061	.0025
Mult R=.4943; SE 23.8784; F(2,202), 32.6492; p .0000						
OSI Composite	OSI Composite	22.10%	21.72%	0.4701	7.589	.0000
Mult R=.4701; SE 24.1840; F(1,203), 57.5865; p .0000						
Personal Desirability	Role-Ambiguity#	9.92%	9.47%	0.3149	4.728	.0000
Mult R=.3149; SE 26.0061; F(1,203), 22.3504; p .0000						
Valence	Physical Environment#	5.00%	4.526%	-0.2235	-3.266	.0013
Mult R=.2235; SE 26.7074; F(1,203), 10.6697; p .0000						
Expectancy	Physical Environment#	14.09%	13.24%	-0.2700	-3.754	.0002
	Role-Overload#			0.1722	2.399	.0173
Mult R=.3753; SE 25.4600; F(2,202) ,16.5623; p .0000						
Belief Soc Supp	Belief Social Support	10.00%	9.56%	0.3161	4.747	.0000
Mult R=.3161; SE 25.9953; F(1,203), 22.5377; p .0000						
Exp Psyc Stress	Expectancy Psyc Stress#	26.00%	25.63%	-0.5099	-8.445	.0000
Mult R=.5099; SE 23.5710; F(1,203), 71.3169; p .0000						
Coping	Recreational	25.13%	24.01%	-0.2778	-4239	.0000
	Rational/Cognitive			-0.2229	-3.459	.0007
	Physical			-0.2086	-3.026	.0028
Mult R=.5013; SE 23.8272; F(3,201), 22.4832; p .0000						
Hardiness	Challenge	32.47%	31.47%	-0.2287	-3.678	.0003
	Commitment			-0.2884	-3.638	.0003
	Control			-0.2190	-2.916	.0039
Mult R= .5699; SE 22.6277; F(3,201), 32.2216; p .0000						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale

3.3.5.4.4.2 Model Building Analyses

The relative effect of specific personal meaning appraisal processes (i.e., valence, expectancy and belief) on strain is shown in Table 3.3.5.14 (results for the Physical and Psychological Strain scales are shown in Appendix G.2.1 & Table G.6). As the table shows, the Expectancy Psychological Stress, Expectancy Physical Environment and Belief Social Support scales explain a moderate 33.22% (32.22% adj) of the variance in composite strain. Further, as the valence assigned to common study stressors was not a significant predictor of strain in any of the models, the valence scales were deleted from subsequent analyses.

Table 3.3.5.14
Backward Regression - Model Building Analyses: Dimensions of Personal Meaning (Specific Appraisals) - Composite Strain on Significant Valence, Expectancy Beliefs Social Support and Expectancy Psychological Stress Predictors of Strain

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
	Expect Psych Stress#			-0.4227	-6.940	.0000
Composite	Belief Social Support	33.22%	32.22%	0.1891	3.142	.0019
Strain	Expect Physical Environ#			-0.1667	-2.697	.0076
Mult R=.5764; SE 22.5028; F(3,201), 33.3257; p .0000						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale

Building on the results from Table 3.3.5.14, the relative effect of more general personal meaning (i.e., the Personal Desirability of stressors) appraisal processes and significant personal meaning appraisal processes (i.e., specific appraisals) on composite strain is summarised in Table 3.3.5.15 (results for physical and psychological strain are shown in Appendix G.2.1 & Table G.7).

Table 3.3.5.15
Backward Regression - Model Building Analyses: Dimensions of Personal Meaning (Specific and General Appraisals) - Composite Strain on Significant Personal Desirability, Expectancy, Beliefs Social Support and Expectancy Psychological Stress Predictors of Strain.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Composite Strain	Expect Psych Stress#	36.59%	35.32%	-0.3916	-6.498	.0000
	Pers Desir R-Ambiguity#			0.1891	3.263	.0013
	Belief Social Support			0.1738	2.946	.0036
	Expect Physical Environ#			-0.1518	-2.508	.0129

Mult R=.6049; SE 21.9817; F(4,200), 28.8545; p .0000

Note: pout ≥ 0.051 (two-tail); #Transformed Scale

As Table 3.3.5.15 shows, both specific (i.e., expectancy and belief) and more general appraisal processes contribute significant information to the explained variance in symptoms of strain. In particular, the personal desirability of role-ambiguity stressors accounts for a significant percentage of the variance in composite strain.

Further, as evident from the solution, the relative effect of specific and general appraisal processes explain an increased and moderate 36.59% (35.32% adj) of the variance in composite strain. In addition, the Expectancy Psychological Stress scale is the most powerful predictor of strain in the final solution.

The results in Table 3.3.5.16 show the relative effect of significant specific and more general appraisal processes on the variance in composite strain when in the presence of significant common stressors. The results indicate that the personal meaning assigned to stressors contributes significant information to the explained variance beyond that explained by common study stressors. Specifically, expectancies for psychological stress, beliefs related to social support and the personal desirability of role-ambiguity stressors contribute significant information to the 39.06% (37.84% adj) of the variance in composite symptoms of strain explained by the model (results for physical and psychological strain are shown in Appendix G.2.1 & Table G.8).

Table 3.3.5.16
Backward Regression - Model Building Analyses: OSI Stressors and Dimensions of Personal Meaning - Composite Strain on Significant OSI Stressor, Personal Desirability, Expectancy, Beliefs Social Support and Expectancy Psychological Stress Predictors of Strain.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Composite Strain	Expect Psych Stress#	39.06%	37.84%	-0.3638	-6.090	.0000
	OSI Composite			0.2450	3.826	.0002
	Belief Social Support			0.1503	2.578	.0107
	Pers Desir R-Ambiguity#			0.1347	2.277	.0238

Mult R=.6250; SE 21.5500; F(4,200), 32.0450; p .0000

Note: pout ≥ 0.051 (two-tail); #Transformed Scale

Further, when compared to the variance in composite strain explained by the common study stressors (i.e., OSI Composite scale), the relative effect of expectancies for psychological stress, beliefs associated with social support and the personal desirability assigned to role-ambiguity stressors accounts for an additional 16.96% (16.12% adj) of the variance in symptoms of composite strain. Equally important, the Expectancy Psychological Stress scale is the most influential predictor of strain in each of the models. Conversely, expectancies for physical environment stressors were non-significant predictors of strain in any of the models. As a result, the stressor expectancy scales were deleted from subsequent analyses.

Table 3.3.5.17 shows the results from the final model building analysis which sought to identify the relative effect of coping strategies on symptoms of strain when in the presence of significant common study stressor and personal meaning predictors of strain (results for the physical and psychological strain are shown in Appendix G.2.1 & Table G.9). As the results show, each coping strategy accounts for a significant percentage of the explained variance in symptoms of strain. As a consequence, the coping scales were retained for subsequent regression analyses.

Table 3.3.5.17
Backward Regression - Model Building Analyses: OSI Common Stressors, Personal Meaning and Coping - Composite Strain on Significant OSI Stressor, Personal Desirability, Expectancy, Belief Social Support, Expectancy Psychological Stress and Coping Predictors of Strain

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
	Expect Psych Stress#			-0.2978	-5.023	.0000
	Belief Social Support			0.1803	3.191	.0017
Composite	Physical Coping#			-0.1652	-2.722	.0071
Strain	Rational/Cognitive Coping	46.92%	45.03%	-0.1373	-2.471	.0143
	OSI Composite			0.1513	2.418	.0165
	Pers Desir R-Ambiguity#			0.1201	2.139	.0336
	Recreational Coping			-0.1235	-2.119	.0353

Mult R=.6850; SE 20.2205; F(7,196), 24.7527; p .0000

Note: pout ≥ 0.051 (two-tail); #Transformed Scale; Composite Stain Model - One case Identified as Multivariate Outlier (i.e., At α 0.001& 7df, Mahal = 25.592 ≥ χ^2 = 24.322) and Deleted From the analyses.

Further, as evident from the table, the model explains a high and substantially increased 46.92% (45.03%) of the variance in composite symptoms of strain from the inclusion of physical, rational/cognitive and recreational coping strategies in the model. In other words, if seen in incremental terms, the model explains an additional 7.86% (7.19% adj) of the variance in composite symptoms of strain from the inclusion of coping strategies in the model. In addition, the solution indicates that both recognition and personal meaning cognitive processes contribute useful information to the variance in composite strain explained by the model. That is, the relative effect of common study stressors, expectancies for psychological stress, beliefs related to social support and the personal desirability of role-ambiguity stressors each explain a significant percentage of the variance in symptoms of composite strain. Moreover, the relative effect of expectancies for psychological stress is the most powerful predictor of composite strain in the model.

3.3.5.4.4.3 Models of Best Fit

The models of best fit sought to identify (a) the relative effect of control, commitment and challenge hardiness cognitive styles when included in the presence of significant common study stressor, personal meaning and coping strategy predictors of strain; and (b) from the predictors of strain in the measurement model, the most parsimonious explanation for the variance in physical, psychological and composite symptoms of strain reported by the sample (results for physical and psychological symptoms of strain are shown in Appendix G.2.2 & Table G.10) .

As the results in Table 3.3.5.18 indicate, the hardiness cognitive styles commitment and control add significant information to the explanation of the variance in composite strain. Further, as evident from the final solution, the model explains a high 53.36% (51.69% adj) of the variance in composite symptoms of strain.[3] Thus, in relation to the final model building analysis, the composite strain model accounts for an additional 6.44% (6.66% adj) of the variance in composite symptoms of the strain. Moreover, as indicated by the table, expectancies for psychological stress is the most powerful predictor of strain in the model.

With respect to the models of best fit, the significant predictors of strain in each model represent the models of best fit which provide the most parsimonious explanation for the variability in physical, psychological and composite symptoms of strain reported by the sample (results for the physical and psychological strain models are shown in Appendix G.2.2, Table G.10). When the results for the models are examined

[3] Note: When the dispositional variables are replaced with the Hardiness scale in the models of best fit, the Physical Strain model explains 44.59% (43.19% adj) of the variance; the Psychological Strain model, 43.30% (42.16% adj) of the variance; and the Composite Strain model, 52.62% (51.18% adj) of the variance.

to identify the model of best fit for the symptoms of strain reported by the sample, the composite strain model may be seen as the model of best fit for the sample. In comparison to those for the physical and psychological strain models, it (a) identifies more predictors of strain; (b) with the exception of the Challenge scale, includes the significant predictors of strain identified in the physical and psychological strain models; and (c) explains the highest percentage of the variance in symptoms of strain. Moreover, in comparison to the solutions for the other models, it identifies belief social support and personal desirability appraisal processes as significant predictors of strain. As the results show, in addition to common study stressor and coping cognitive processes, the model identifies specific (i.e., expectancy psychological stress and beliefs social support) and more general (i.e., personal desirability of role-ambiguity stressors, commitment and control hardiness cognitive styles) appraisal processes as significant predictors of strain.

Table 3.3.5.18
Backward Regression - Model of Best Fit: Composite Strain on Significant OSI Stressor, Personal Desirability, Expectancy, Belief Social Support, Expectancy Psychological Stress, Coping and Hardiness Predictors of Strain

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
	Expect Psych Stress#			-0.2925	-5.279	.0000
	Commitment			-0.2211	-3.382	.0009
Composite	Belief Social Support			0.1553	2.924	.0039
Strain	Pers Desir R-Ambiguity#	53.36%	51.69%	0.1335	2.540	.0119
	OSI Composite			-0.1428	2.450	.0152
	Physical Coping#			-0.1326	-2.395	.0176
	Control			-0.1428	-2.225	.0272

Mult R=.7305; SE 18.9554; F(7,196), 32.0290; p .0000

Note: pout ≥ 0.051 (two-tail); #Transformed Scale; One case Identified as Multivariate Outlier (i.e., At α 0.001 & 6df, Mahal = 24.700 ≥ χ^2 = 22.458) and Deleted From Both Best Fit and Hierarchical Analyses.

3.3.5.4.4.4 Hypothesis Testing and the Incremental Effect of Specific and General Dimensions of Appraisal on Strain

Hierarchical modelling was used to test the theoretical importance and identify the incremental effect of (a) specific and more general personal meaning appraisal processes and (b) personal desirability appraisal processes in the stressor to strain relationship. In addition, hierarchical analyses were used to identify (a) the cumulative effect of general and specific appraisal processes and (b) the unique effect of general appraisal processes on the variance in composite strain. That is, these analyses were used to test the principal hypothesis of the thesis (H1) that the incremental effect of the personal meaning assigned to sources of stress would add significant information to the cumulative variance in symptoms of composite strain explained by the model. In addition, they sought to test the hypothesis (H2) that the personal desirability assigned to sources of stress will add useful information to the cumulative variance in physical, psychological and composite symptoms of strain explained by the respective models. For each model, the significant predictors of strain in the models of "best fit" were used to form the respective models.

The results in Table 3.3.5.19 demonstrate (a) the theoretical importance of personal meaning in the stressor to strain process and (b) that the incremental effect of the personal meaning assigned to sources of stress adds useful information to the cumulative variance in composite strain. As the table shows, the incremental effect of expectancy psychological stress, belief social support and the more general personal desirability appraisal processes add a moderate 12.08% (11.59% adj) to the 27.29% (26.56% adj) explained by commitment and control cognitive styles and the 13.99% (13.54% adj) explained by OSI common study stressors and physical coping cognitive processes. That is, having "partialled out" or partioned the variance common to (a) dispositions

for hardiness, (b) common study stressors and (c) coping cognitive processes, the incremental effect of personal meaning appraisal processes adds a unique and significant 12.08% (11.59% adj) to the cumulative variance in symptoms of composite strain (results for the physical and psychological strain models are shown in Appendix G.2.3, Tables G.11 & G.12).

Table 3.3.5.19
Hierarchical Regression: Composite Strain on Significant Dispositional (i.e., Hardiness), Recognition (i.e., OSI Common Stressor & Coping) and Personal Meaning (i.e., Expectancy Psychological Stress, Belief Social Support, and Personal Desirability) Predictors of Strain

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
	Step 1								
Hardiness	Commitment	27.29%	26.56%	27.29%	.0000	-0.3754	-1.663 - -0.697	-4.819	.0000
	Control					-0.1960	-1.279 - -0.155	-2.515	.0127
Mult R=.5224; SE 23.3710; F(2,201) 37.7105; p. 0000									
	Step 2								
Stressor/ Coping	OSI Composite	41.28%	40.10%	13.99%	.0000	0.3300	0.161 - 0.326	5.797	.0000
	Physical Coping#					-0.1576	-8.525 - -1.293	-2.677	.0080
Mult R=.6425; SE 21.1080; F(4,199) 34.9671; p. 0000									
	Step 3								
Expectancy /Belief/ Desirability	Exp Psyc Stress#	53.36%	51.69%	12.08%	.0000	-0.2925	-13.374 - -6.099	-5.279	.0000
	Blf Social Supp					0.1553	0.202 - 1.038	2.924	.0039
	Role-Ambiguity#					0.1335	1.518 - 12.072	2.540	.0119
Mult R=.7305; SE 18.9554; F(7,196) 32.0290; p. 0000									

Note: #Transformed Variable.

Furthermore, in comparison to the 27.29% (26.56% adj) of the variance explained by dispositional factors in the model, the combined effect of recognition (i.e., common study stressor and coping) and personal meaning cognitive processes account for an additional 26.07% (25.13% adj) of the explained variance in symptoms of composite

strain. Therefore, and directly applicable to the principal aim of this thesis, these results demonstrate that recognition and personal meaning cognitive processes have, it would seem, equal importance in the mental algorithm underlying the appraisal of an imbalance between actual (i.e., recognition) and ideal (i.e., personal meaning) stressors. Moreover, if distinguished in terms of theoretical importance, they demonstrate that recognition cognitive processes account for only 13.99% (13.54% adj) of the variance in symptoms of composite strain and the spectrum of appraisal processes, a dominant 39.37% (38.15% adj) of the variance in composite strain. That is, if seen in proportional terms, recognition cognitive processes account for 26.22% of the variance explained by the model and personal meaning appraisal processes, 73.78% of the variance explained by the model.

Accordingly, on the basis of this result, there was support for the principal hypothesis of the thesis (H1) that the personal meaning assigned to sources of stress would account for a significant percentage of explained variance in symptoms of strain when placed in the presence of dispositional, recognition and coping cognitive processes.

The results in Table 3.3.5.20 further explore the relative importance of descriptive and personal meaning cognitive processes in the stressor to strain process. As the results indicate, when the variables in the model are grouped on the basis of descriptive and personal meaning cognitive processes, the descriptive component explains a moderate 28.65% (27.94% adj) of the variance in composite strain and the cumulative effect of the personal meaning component, 24.71% (23.75% adj) of the variance in composite strain. That is, in proportional terms, the data demonstrates that specific and general personal meaning appraisal processes account for 45.95% of the variance in composite strain explained by the model.

Table 3.3.5.20
Hierarchical Regression: Composite Strain on Significant Descriptive, Specific Appraisal, and General Appraisal Predictors of Strain

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
Model 1: Cumulative Effect of Specific and General Appraisal Processes									
	Step 1								
Descriptive	OSI Composite	28.65%	27.94%	28.65%	.0000	0.3973	0.204 - 0.382	6.474	.0000
	Physical Coping#					-0.2759	-12.37 - -4.83	-4.495	.0000
Mult R=.5353; SE 23.1504; F(2,201) 40.3568; p .0000									
	Step 2								
	Exp Psyc Stress#					-0.2925	-13.37 - -6.10	-5.279	.0000
General & Specific Appraisals	Commitment					-0.2211	-1.10 - -0.29	-3.382	.0009
	Blf Social Supp	53.34%	51.69%	24.71%	.0000	0.1553	0.20 - 1.04	2.924	.0039
	Desir R-Ambig#					0.1335	1.52 - 12.07	2.540	.0119
	Control					-0.1428	-0.99 - 0.06	-2.225	.0272
Mult R=.7305; SE 18.9554; F(7,196) 32.0290; p .0000									
Model 2: Incremental Effect of General Appraisal Processes									
	Step 1								
Descriptive	OSI Composite	28.65%	27.94%	28.65%	.0000	0.3973	-12.37 - -4.83	6.474	.0000
	Physical Coping#					-0.2759	0.20 - 0.38	-4.495	.0000
Mult R=.5353; SE 23.1504; F(2,201) 40.3568; p .0000									
	Step 2								
Specific Appraisals	Exp Psyc Stress#					-0.3268	-14.80 - -6.97	-5.480	.0000
	Blf Social Supp	44.32%	42.91%	15.66%	.0000	0.1927	0.32 - 1.22	3.364	.0009
	Desir R-Ambig#					0.1294	0.85 - 12.32	2.266	.0245
Mult R=.6657; SE 20.6063; F(5,198) 31.5144; p .0000									
	Step 3								
General Appraisals	Commitment	53.36%	51.69%	09.04%	.0000	-.2211	-1.10 - -0.29	-3.382	.0009
	Control					-.1428	-0.99 - -0.06	-2.225	.0272
Mult R=.7305; SE 18.9554; F(7,196) 32.0290; p .0000									

Note: #Transformed Variable

In addition, Table 3.3.5.20 further unpacks the relative importance of specific and general personal meaning appraisal processes in the stressor to strain relationship. As the results show, having partialled out the variance common to descriptive and specific cognitive processes, the unique effect of specific dimensions of appraisal accounts for 15.66% (14.97% adj) of the explained variance and the unique effect of general dimen-

sions of appraisals, a reduced 9.04% (8.78% adj) of the variance in composite strain. In other words, the results indicate that general appraisal processes (i.e., commitment and control hardiness cognitive styles) account for 36.58% of the variance in composite strain explained by personal meaning appraisal processes; and 16.94% of the variance explained by the model.

Table 3.3.5.21 indicates that the personal desirability of role-ambiguity stressors explains a significant percentage of the variance in symptoms of composite strain when placed in the presence of significant hardiness, OSI common stressor, coping and personal meaning predictors of strain (note: (i) the personal desirability of role-ambiguity stressors was not a significant predictor of strain in the psychological strain model of best fit; (ii) results for physical strain are shown in Appendix G.2.3 & Table G.13). As the results show, although rather low, the incremental effect of the personal desirability of role-ambiguity stressors adds a significant 1.54% (1.34% adj) to the cumulative variance in composite strain explained by the model.

Therefore, given these results, there is support for both the theoretical importance and relative significance of personal desirability in the transactional view of stress. The results highlight the importance of personal desirability appraisal processes in the mental summation of the appraised imbalance between actual (i.e., recognition of stressors) and ideal (i.e., personal desirability of stressors) and translation of stress to symptoms of strain. Furthermore, there is support for the hypothesis (H2) that the personal desirability of common study stressors would explain a significant percentage of the cumulative variance when placed in the presence of significant dispositional, common stressor, coping behaviour and personal meaning predictors of strain.

Table 3.3.5.21
Hierarchical Regression: Composite Strain on Hardiness, OSI Common Stressor, Coping, Belief Social Support, Expectancy Psychological Stress and Personal Desirability

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
	Step 1								
Hardiness	Commitment	27.29%	26.56%	27.29%	.0000	-0.3754	-1.663 - -0.697	-4.819	.0000
	Control					-0.1960	-1.279 - -0.155	-2.515	.0127
Mult R=.5224; SE 23.3710; F(2,201) 37.7105; p. 0000									
	Step 2								
Stressor	OSI Composite	39.16%	38.25%	11.88%	.0000	0.3559	0.180 - 0.345	6.248	.0000
Mult R=.6258; SE 21.4310; F(3,200) 42.9107; p. 0000									
	Step 3								
Coping	Physical#	41.28%	40.10%	2.12%	.0080	-0.1576	-8..525 - -1.293	-2.677	.0080
Mult R=.6425; SE 21.1080; F(4,199) 34.9671; p. 0000									
	Step 4								
Expectancy/	Exp Psyc Stress#	51.82%	50.35%	10.55%	.0000	-0.3000	-13.668 - -6.304	-5.349	.0000
Belief	Blf Social Supp					0.1608	0.218 - 1.065	2.989	.0032
Mult R=.7199; SE 19.216; F(6,197) 35.3153; p. 0000									
	Step 5								
Desirability	Role-Ambiguity#	53.36%	51.69%	1.54%	.0119	0.1335	1.518 - 12.072	2.540	.0119
Mult R=.7305; SE 18.9554; F(7,196) 32.0290; p. 0000									

Note: #Transformed Variable

3.3.5.4.5 The Effect of Low and High Hardiness Cognitive Styles on Strain

The results in Tables 3.3.5.22 to 3.3.5.24 further explore the role of low and high Hardiness cognitive styles in the stressor to strain process. For these analyses, scores for hardiness (n = 205) were split into quartiles (i.e., n ≈ 51) and the extreme hardiness quartiles used to form the low (n = 51) and high (n = 53) groups. As the results in the tables show, dispositions for low and high hardy cognitive styles (a) substantially influence the magnitude of the variance in composite strain explained by the model and (b) discriminate the importance of recognition, coping and personal meaning cognitive processes in the transactional processes underlying stress and strain.

Table 3.3.5.22 indicates that the low and high hardy cognitive styles discriminate the importance of personal desirability appraisal processes in the transactional relationship with symptoms of composite strain. Further, it indicates that low hardiness substantially increases the amount of variance explained by the model. Thus, on the basis of these results, low hardy cognitive styles may be seen to elevate the importance of the personal desirability assigned to common role-insufficiency stressors; in contrast, those with high hardy cognitive styles elevate the importance of the personal desirability assigned to common role-ambiguity stressors. As the table indicates, for the low hardiness sample, the personal desirability of role-insufficiency stressors explains a moderate 14.09% (12.34% adj) of the variance in symptoms of composite strain; whereas for the high hardiness sample, the personal desirability of role-ambiguity stressors explains a substantially reduced 8.75% (6.96% adj) of the variance in composite strain.

Table 3.3.5.22
Backward Regression: Low and High Hardiness Samples - Composite Strain on Personal Desirability

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Low Hardiness	Role-Insufficiency#	14.09%	12.34%	0.3754	2.835	.0066
Mult R=.3754; SE 22.3670; F(1,49), 8.0371; p .0066						
High Hardiness	Role-Ambiguity#	8.75%	6.96%	0.2957	2.211	.0316
Mult R=.2957; SE 24.5093; F(1,51), 4.8876; p .0316						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale

Table 3.3.5.23 demonstrates the effect of low and high hardy cognitive styles on significant OSI common stressor (see Table 3.3.5.13) and personal meaning (see Table 3.3.5.15) predictors of strain on symptoms of composite strain. The low hardiness

sample discriminates the importance of common study stressors and expectancies for psychological stress as significant sources of stress related to composite strain; in contrast, the high hardiness sample discriminates the importance of expectancies for psychological stress and beliefs associated with social support as significant sources of stress which underlie symptoms of composite strain. Further, for both the low and high hardiness samples, expectancies for psychological stress is a significant predictor of strain.

As the results show, for the low hardiness sample, the relative effect of OSI common stressors and expectancies for psychological stress explain a high 35.01% (32.30% adj) of the variance in composite strain. Conversely, for the high hardiness sample, expectancies for psychological stress and beliefs related to social support demands explain a reduced and moderate 19.76% (16.55% adj) of the variance in composite strain. Furthermore, with respect to the variance explained by the models, the variance in strain explained by the high hardiness sample is approximately double that explained by the low hardiness sample.

Table 3.3.5.23
Backward Regression - Low and High Hardiness: Composite Strain on Significant Common Study Stressor and Personal Meaning Predictors of Strain.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Low Hardiness	OSI Composite	35.01%	32.30%	0.3792	3.114	.0031
	Expect Psyc Stress#			-0.3558	-2.921	.0053
Mult R=.5917; SE 19.6530; F(2,48), 12.9264; p .0000						
High Hardiness	Expect Psyc Stress#	19.76%	16.55%	-0.3233	-2.550	.0139
	Belief Social Support			0.2914	2.298	.0258
Mult R=.4445; SE 23.2111; F(2,50), 6.1568; p .0041						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale

Table 3.3.5.24 illustrates the mediating effect of low and high hardy cognitive styles on significant OSI common stressors, personal meaning, coping and hardiness predictors of strain (see Tables 3.3.5.17 & 3.3.5.18) and their relationship with symptoms of composite strain. Those with low hardy cognitive styles discriminate the importance of expectancies for psychological stress, OSI common stressors, control and the use of rational/cognitive coping as significant predictors of composite strain. By contrast, those with hardy cognitive styles discriminate expectancies for psychological stress, beliefs associated with social support and commitment as significant predictors of composite strain.

Table 3.3.5.24
Backward Regression - Low and High Hardiness: Composite Strain on Significant OSI Common Stressor, Personal Meaning, Coping and Hardiness Predictors of Strain

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Low Hardiness	Expect Psyc Stress#	55.55%	51.68%	-0.3933	-3.810	.0004
	OSI Composite			0.3762	3.648	.0007
	Control			-0.3350	-3.270	.0020
	Rat/Cognit Coping			-0.2321	-2.273	.0277
Mult R=.7453; SE 16.6053; F(4,46) 14.3712; p .0000						
High Hardiness	Expect Psyc Stress#	29.47%	25.06%	-0.3090	-2.490	.0163
	Belief Social Support			0.2853	2.338	.0236
	Commitment			-0.2807	-2.267	.0280
Mult R=.5428; SE 22.0903; F(3,48) 6.6847; p .0007						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale

Furthermore, for both low and high hardiness cognitive styles, expectancies for psychological stress is the most powerful predictor of strain in the respective models. Seemingly, then, on the basis of this data, dispositions for hardiness do not discriminate expectancies for psychological stress. Moreover, in comparison to the high hardiness

sample, the low hardiness sample explains more than twice the variance in symptoms of composite strain. As the table shows, the significant predictors of strain related to the low hardiness sample explain a high 55.55% (51.68% adj) of the variance in composite strain; in contrast, those relevant to the high hardiness sample explain a substantially reduced 29.47% (25.06% adj) of the variance in symptoms of composite strain.

3.3.5.4.6 "Like More" "About Right" and "Like Less" Response Anchor Analyses

These analyses sought to further unpack the nature and effect of the personal desirability assigned to common study stressors. As Table 3.3.5.25 shows, the appraisal of the personal desirability of common study stressors in terms of "Like More" (i.e., desirable) "About Right" (i.e., congruence) and "Like Less" (i.e., undesirable) each explain a significant percentage of the explained variance in composite symptoms of strain (note: results for physical and psychological strain are shown in Appendix G.2.4, Tables G.14 & G.15).

Table 3.3.5.25
Backward Regression: Composite Strain on Personal Desirability for "Like More" "About Right" and "Like Less" of Common study Stressors

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
"Like More"	Role-Ambiguity#	11.69%	11.25%	0.3418	5.182	.0000
Mult R=.3418; SE 25.7500; F(1,203) 26.8581; p .0000						
"About Right"	Role-Ambiguity#	14.14%	13.29%	-0.2251	-3.124	.0020
	Role-Insufficiency#			-0.2203	-3.057	.0025
Mult R=.3761; SE 25.4515; F(2,202) 16.6391; p .0000						
"Like Less"+	Role-Boundary#	4.69%	4.22%	0.2165	3.159	.0018
Mult R=.2165; SE 26.751; F(1,203) 9.9814; p .0018						

Note: Pout, ≥ 0.051; # Transformed Variable; "Like Less"+ - Due Significant Skewness, the Role-Ambiguity and Role-Insufficiency Scales Were Removed From Model (See Tables 4.5.4 & 4.5.5).

The results indicate that the personal desire for more role-ambiguity stressors explains a low 11.69% (11.25% adj) of the variance in composite strain. Conversely, when common stressors are appraised in terms of "Like Less" of the stressors, the desire for less role-boundary stressors explains a significant but substantially lower 4.69% (4.22% adj) of the variance in symptoms of composite strain. In contrast, when common study stressors are appraised in terms of "About Right" for the person, the personal satisfaction with role-ambiguity and role-insufficiency stressors explains a higher and moderate 14.14% (13.29% adj) of the variance in composite strain.

Summary of Results

Taken together, the results indicate that the relationship between the desirability of common study stressors in terms of "Like More" "About Right" and "Like Less" and strain is relatively consistent across the dimensions of strain. Furthermore, due to the commonality of the predictors across the "Like More" and "About Right" models, there is evidence of an overlap in the appraisal of "like More" and "About Right" with stressors. This suggests that (a) these dimensions of appraisal may in effect reduce to a common dimension of person desirability (i.e., personal underload), or alternatively (b) that more discrete scores for "Like More" and "About Right" with a stressor (i.e., the use of scores greater than zero) are required to discriminate the personal desirability assigned to stressors. However, although the results suggest an overlap in the appraisal of common study stressors, the Beta coefficients for the "Like More" and "About Right" models are in effect reversed. This suggests that (a) these domains of appraisal are relatively discrete and (b) have unique or direct relationships with symptoms of strain.

Nonetheless, on the basis of these results, there is support for the hypothesis (H3) that the appraisal (i.e., personal desirability assigned to stressors) of common study stressors in terms of (a) desirable, (b) undesirable and (c) congruence (i.e., balance) would each explain a significant percentage of the variability in symptoms of strain.

3.3.5.4.7 The Correspondence Between the Personal Desirability of Common Stressors and Dimensions of Strain

Due to the finding that "Like More" "About Right" and "Like Less" appraisals of personal desirability each explain a significant percentage of the variance in strain, it is likely that the corresponding mean strain scores for physical, psychological and composite strain will vary in sympathy with the meaning assigned to the stressor (see results studies five and six). Therefore, based on the transactional tenet that the appraisal of an imbalance with a stressor (i.e., "Like More" or "Like Less" of the stressor) may subsequently reflect in symptoms of strain, it is reasonable to hypothesise that the corresponding mean scores for strain will be significantly higher than the corresponding "About Right" mean scores for strain. Furthermore, it is likely that increases in the magnitude of the appraised imbalance between actual and ideal demands (i.e., increases in "Like More or "Like Less" of the stressor) will correspond to an increase in symptoms of strain. Conversely, for increases in the personal satisfaction assigned to a stressor (i.e., "About Right"), it is reasonable to postulate that increases in the personal satisfaction with work stressors will reflect as a reduction in symptoms of strain.

Table 3.3.5.26 shows the correspondence between increases in the scores for both the Composite Personal Desirability and the Role-Responsibility Personal Desirability scales and the corresponding mean scores for physical, psychological and composite strain; and Tables 3.3.5.27, the results from correlated samples T Tests which compared

the mean scores for composite strain corresponding to increases in the magnitude of the scores for the "Like More" "About Right" and "Like Less" Composite Personal Desirability and Role-Responsibility Personal Desirability scales.[4]

In addition, Figures 4.5.1 to 4.5.2 illustrate the correspondence between increases in the scores for (a) the Composite Personal Desirability scale and (b) Role-Responsibility Personal Desirability scale and the mean scores for composite strain (graphical data for physical and psychological strain is shown in Appendix G.3 & Figures G.1 to G.4).

The results in Table 3.3.5.26 show that increases in the magnitude of the response to the "Like More" "About Right" and "Like Less" Composite Personal Desirability and the Role-Responsibility Personal Desirability scales correspond to changes in the magnitude of physical, psychological and composite symptoms of strain. Those corresponding to the "Like More" and "Like Less" scales reflecting a gradual increase in symptoms of strain; and those for the "About Right" scale, to a gradual decrease in strain related outcomes. For instance, the composite strain mean scores corresponding to the "Like More" scale from the Composite Personal Desirability scale increase from 113.663 for the baseline sample to a maximum of 122.214 for the 25% sample. Conversely, those corresponding to the "About Right" scale, reflect a substantial decrease from a high of 113.663 to a minimum of 99.167 for the 25% sample.

Furthermore, the table indicates that there are consistent and likely significant differences between the mean strain scores for each of the samples. As evident from the data, increases in the magnitude of the appraised imbalance (balance) with a stressor corresponds to noticeable differences between the strain mean scores for each sample. For

[4] Note: The Role-Responsibility Personal Desirability scale was chosen as the basis for the comparisons of mean strain scores as it had the more normal distribution of responses to the "Like More" "Like Less" and "About Right" response anchors of the scale (see Appendix G.1.1.3, Table G.4).

Table 3.3.5.26
Personal Desirability Scales: Comparison of Physical, Psychological and Composite Strain Mean Scores Corresponding to "Like More" "Like Less" and "About Right" Response Anchors

Evaluative Scale	Select If#	Cases Selected	Mean Eval Scale	Mean Phys Strain	Mean Psyc Strain	Mean Comp Strain
Composite Personal Desirability Scale: Mean Score Differences						
Baseline Mean scores: Scores Greater Than Zero						
Desirability						
Like More	GT 0	205	29.376	85.332	42.673	113.663
About Right	GT 0	205	56.039	85.332	42.673	113.663
Like Less	GT 0	198	14.313	85.449	42.798	113.808
Sample Size ≈ 75% of Sample						
Desirability						
Like More	GT 20	150	35.233	90.087	44.320	119.233
About Right	GT 36	151	66.384	82.874	40.987	110.007
Like Less	GT 7	141	18.305	87.106	44.284	116.660
Sample Size ≈ 50% of Sample						
Desirability						
Like More	GT 29	94	41.596	91.394	44.936	120.755
About Right	GT 56	95	77.053	78.600	39.074	104.526
Like Less	GT 13	93	22.505	89.054	45.806	119.860
Sample Size ≈ 25% of Sample						
Desirability						
Like More	GT 41	42	50.786	90.619	47.333	122.214
About Right	GT 76	42	88.952	73.786	37.548	99.167
Like Less	GT 21	40	29.525	90.675	48.025	123.375
Role Responsibility Scale: Mean Score Differences						
Baseline Mean Scores: Scale Mean Scores						
Desirability						
Like More	ALL	205	2.620	85.322	42.673	113.663
About Right	ALL	205	11.7272	85.322	42.673	113.663
Like Less	ALL	205	2.746	85.322	42.673	113.663
Evaluative Score GT Zero						
Desirability						
Like More	GT 0	126	4.262	87.706	42.738	115.603
About Right	GT 8	130	15.538	82.838	41.192	110.169
Like Less	GT 0	106	5.311	87.915	45.368	118.425
Sample Size ≈ 50% of Sample						
Desirability						
Like More	GT 2	81	5.519	88.568	42.667	116.358
About Right	GT 12	78	17.897	82.282	41.385	109.923
Like Less	GT 2	70	7.014	87.871	46.114	119.186
Sample Size ≈ 25% of Sample						
Desirability						
Like More	GT 4	39	7.462	90.000	43.359	118.179
About Right	GT 16	37	20.000	80.811	40.838	108.324
Like Less	GT 5	38	9.605	89.237	47.079	121.000

Note: n = 205; Select If# - Cases Selected Using the Scores from the Respective Personal Desirability Composite and Role-Responsibility Personal Desirability Scales (see Table 4.5.6); Phys Strain - Physical Strain, Psyc Strain - Psychological Strain, Comp Strain - Composite Strain.

example, when related to the Composite Personal Desirability scale and a sample size ≈ 25% of the sample, the mean scores for psychological strain corresponding to "Like More" and "Like Less" (i.e., 47.333 & 48.025) are significantly higher than the "About Right" mean score (i.e., 37.548). In other words, albeit implicit, the data indicates that the nature of the transactional relationship with a stressor (i.e., the appraised imbalance or personal desirability of stressors) subsequently reflects in the direction of strain related outcomes.

Figures 4.5.1 and 4.5.2 further illustrate the linkage between the appraisal of common study stressors and symptoms of strain. As the graphs show, increases in the scores for "Like More" and "Like Less" of common study stressors, generally correspond to higher levels of composite strain (graphical data related to physical and psychological strain is shown in Appendix G.3 & Figures G.1 to G.4). Conversely, increases in scores for "About Right" with common study stressors (i.e., increases in personal satisfaction), correspond to a noticeable decline in symptoms of strain. Thus, based on the scope of this data, there is descriptive support for the hypothesis (H4) that increases in the appraisal of a common study stressor as either more desirable or more undesirable corresponds to an increase in symptoms of strain; and increases in the appraisal of congruence (i.e., satisfaction) with common study stressors, to a decrease in symptoms of strain.

Tables 3.3.5.27 shows the results from correlated T Tests which test the significance of the mean differences ($\alpha \leq 0.008$) between the mean strain scores for composite strain corresponding to mean scores for the "Like More" "About Right" and "Like Less"

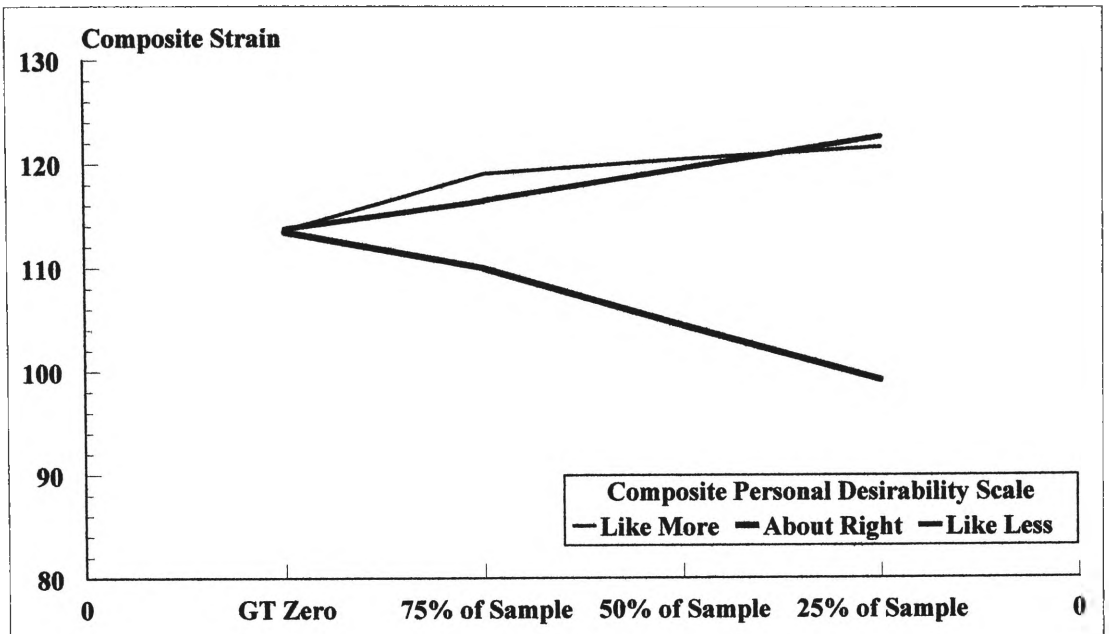


Figure 3.3.5.1 Composite Personal Desirability Scale: Comparison of Composite Strain Mean Scores

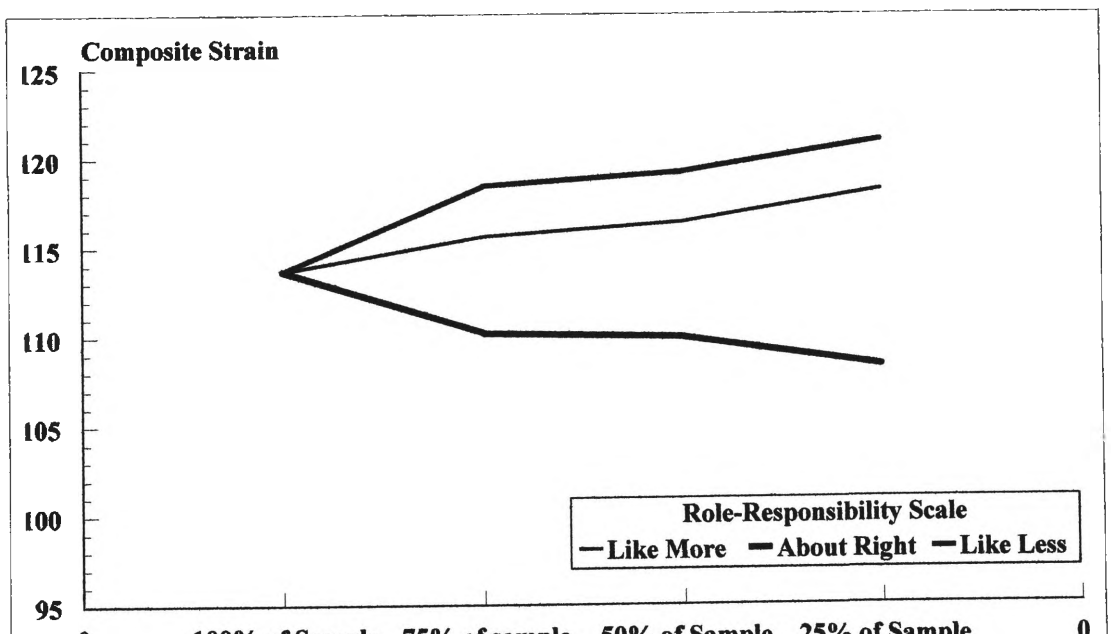


Figure 3.3.5.2 Role-Responsibility Scale: Comparison of Composite Strain Mean Scores

scales.[5] As the results show, from the comparisons related to the Composite Personal Desirability scale, significant differences exist between the mean strain scores for composite strain corresponding to mean scores for (a) "Like More" and "About Right" and (b) the "Like less" and "About Right" Personal Desirability scales (results for physical and psychological strain are shown in Appendix G.3, Tables G.16 & G.17).[6]

Similarly, from the comparisons of mean strain scores related to the personal desirability of role-responsibility stressors, there are significant differences between the mean strain scores for composite strain corresponding to mean scores for the "Like More" "About Right" and "Like Less" scales. As the table indicates, with the exception of those for the 50% sample related to "like More" and "About Right", there are significant differences between the mean strain scores corresponding to "Like More" and "About Right" with role-responsibility stressors; and similarly those for "like Less" and "About Right" with role-responsibility stressors.

Consequently, on the basis of these results, there is support for the hypothesis (H5) that strain mean scores corresponding to the appraisal of common study stressors as either desirable or undesirable will be significantly higher than strain mean scores corresponding to the appraisal of congruence or personal satisfaction with common study stressors.

---

[5] See Footnote E3, Appendix E.4.5 re discussion on the comparison of correlated samples with missing values. See also Howell, 1992, p. 177.

[6] Note: Due to multiple comparisons (6) and thereby familywise errors, the Significance of T* for each T Test is adjusted from $\alpha = 0.05$ to 0.008 (i.e., $\alpha' = 0.05/6$).

Table 3.3.5.27
Statistical Comparison of Composite Strain Mean Scores Corresponding to "Like More" "Like Less" and "About Right" Evaluative Scores

Evaluative Scale	No Cases Retained	Missing Values	Random Sample	Scale Mean	SE of Mean Diff	T	Signif T*
Composite Personal Desirability Scale							
Sample Size ≈ 50% of Sample							
Like More	203	109	94	122.06	2.564	-6.77	.000
About Right	203	108	94	104.71	----	----	----
Like Less	203	110	94	117.84	2.427	-5.41	.000
About Right	203	108	94	104.71	----	----	----
Sample Size ≈ 25% of Sample							
Like More	110	68	42	122.25	4.150	-4.95	.000
About Right	110	68	42	101.72	----	----	----
Like Less	110	70	42	121.58	4.035	-4.92	.000
About Right	110	68	42	101.72	----	----	----
Role-Responsibility Common Study Stressor							
Sample Size ≈ 50% of Sample							
Like More	196	115	79	114.77	2.105	-1.54	.128
About Right	196	118	79	111.53	----	----	----
Like Less	196	126	79	118.94	2.155	-3.44	.001
About Right	196	118	79	111.94	----	----	----
Sample Size ≈ 25% of Sample							
Like More	110	71	38	119.18	3.504	-3.34	.002
About Right	110	73	38	107.49	----	----	----
Like Less	110	72	38	122.19	4.057	-3.62	.001
About Right	110	73	38	10749	----	----	----

Note: For Each Block of Comparisons (i.e., Each Random Sample), Required α for Signif T* adjusted from 0.05 to 0.008 (i.e., $\alpha/c = .05/6 = 0.008$)

3.3.5.5 Discussion

The present study further illustrates the importance and functional role of personal meaning appraisal processes in the stressor to strain process. In particular, the results indicate that individual differences in both specific and more general appraisal processes may be seen to underlie the variability in symptoms of personal strain. In short, they indicate that appraisal processes associated with (a) the personal meaning assigned to intrinsic and extrinsic sources of stress and (b) hardiness cognitive styles contribute

significant information to the explanation of strain related outcomes. Furthermore, when the results are seen in transactional terms, there is strong evidence to suggest that personal meaning and hardiness appraisal processes are in effect the dominant cognitive processes underlying the appraisal of an imbalance (balance) between actual (i.e., recognition) and ideal (i.e., personal meaning) sources of stress and the subsequent translation to symptoms of strain.

With respect to the principal aim of study, the results demonstrate that measures of personal meaning explain a significant percentage of the variance in symptoms of strain. Furthermore, and perhaps the most important finding, they show that it is possible to conceptualise and measure the nature of the personal meaning assigned to sources of intrinsic and extrinsic stress in several ways. As the results show, the appraisal of expectancies for psychological stress, beliefs associated with social support (i.e., home/work interface) and the personal desirability of role-ambiguity stressors each contribute significant information to the explained variance in strain beyond that explained by common study stressors. Further, when included in models of best fit, they account for a significant percentage of the variance in strain beyond that explained by common study stressor, coping and hardiness cognitive processes. As the results for the composite strain model indicate, expectancy, belief and personal desirability appraisal processes each add significant information to the variance in composite strain explained by the model (i.e., 53.36% - 51.69% adj).

Although somewhat contrary to the results from study four, the more specific Expectancy for Psychological Strain scale is the most powerful predictor of strain in the models of best fit. As the results for study four show, expectancies for psychological stress were insignificant predictors of strain in the models of best fit. Their interaction with rational/cognitive coping did, however, explain a small but significant percentage

of the variance in symptoms of psychological strain. Therefore, in comparison to the low correlations with strain reported in study four (e.g. 0.28** with composite strain), the moderate correlations with strain for the present study (e.g., 0.51** with composite strain), are somewhat higher than expected. Consequently, it would seem worthwhile to revisit this issue.

As discussed at length in study four (Chapter 3.2.4.4.3 & Table 3.2.4.3) and the present study (Chapter 3.3.5.4.3.5 & Table 3.3.5.7), qualitative and quantitative item analyses concluded that there was no evidence of inflated item-item or item-scale correlations from the limited semantic overlap between items in the Expectancy Psychological Stress and Psychological Strain scales. However, one methodological difference between the studies which may explain the increased correlations with strain, is the increased variability in the range of the Expectancy Psychological Stress scale. When compared to the descriptive data for study four, the response format for the scale is increased from a three point "Yes" (3) "No" (0) "Sometimes" (1) format to an eight point differential format (i.e., +4 to -4) and thus the range of the scale is effectively increased from 0 - 15 to 5 - 40. As a result, the range of observed responses is increased from 0 - 15 to a higher 12 - 40 and the SD for the range of responses to the scale increased from 4.361 to 5.360. Further, in comparison to study four, the distribution of responses changes from significant positive skewness (i.e., 0.551) to significant negative skewness (i.e., 0.672) and the reliability of the scale from a moderate $\alpha = 0.7894$ to a lower $\alpha = 0.7029$. As a result, it may be the case that the increased correlations with strain reflect the increased variability in the response scale. Furthermore, as the questionnaire was placed last in the inventory and the lengthy nature of the inventory, the reduced alpha coefficient is likely a reflection of random response bias from the effect of respondent fatigue.

Hierarchical modelling was used to confirm the theoretical importance and incremental effect of the significant personal meaning appraisal processes in the model of best fit for composite strain. The personal meaning assigned to sources of stress adds a moderate 12.08% (11.59% adj) to the variance in composite strain explained by hardiness, common stressor and coping cognitive processes (i.e., 41.28% - 40.10% adj). As result there was support for hypothesis H1 that the personal meaning of stressors would add significant information to the explanation of strain when placed in the presence of significant recognition, coping and hardiness predictors of strain. Furthermore, on the basis of these results, there is in effect support for the principal aim of the thesis which sought to show that the transactional meaning assigned to stressors accounts for variance in strain beyond that explained by the recognition of stressors.

The results for the hierarchical model are perhaps more informative in that they more clearly distinguish the theoretical importance of cognitive processes in the model. As the results indicate, the unique effect of commitment and control hardiness cognitive styles account for 27.29% (26.56% adj) of the variance in composite strain and the unique effect from the recognition of common study stressors and coping strategies a reduced but moderate 13.99% (13.54% adj) of the variance in symptoms of composite strain. In other words, the results indicate that having "partialled out" or partioned the variance common to hardiness, the variance in composite strain explained by recognition and personal meaning appraisal processes (i.e., 12.08% - 11.59% adj) is approximately equal to that explained by recognition processes. In effect, the result highlights (a) the significant role of personal meaning appraisal processes in strain related outcomes and (b) the mediating role of dispositional factors in the stressor to strain process; and (c) the necessity to account for the variance explained by dispositional tendencies in models of stress.

Furthermore, when compared to the findings of previous studies (e.g., study one), the percentage of variance explained by personal meaning in the model would seem to contradict the findings of studies which show that common stressors invariably explain the greater percentage of the variance in strain. The result for the present study, however, would seem to suggest that recognition and personal meaning cognitive processes are both equally involved in the stressor to strain process. Further, when the predictors in the model are aligned with recognition and appraisal cognitive processes, the data indicates that recognition processes account for only 13.99% (13.54% adj) of the explained variance; and appraisal processes 39.37% (38.15% adj) of the variance in symptoms of composite strain. That is, the data indicates that 73.78% of the variance explained by the model is confined to the relative effect of appraisal processes. Therefore, this result would seem to suggest that appraisal processes are the principal and perhaps dominant cognitive process in the nature of the transactional process underlying stress and strain (Cox, 1978; Cox & Ferguson, 1991; Lazarus, 1984; Lazarus & Folkman, 1987). Furthermore, the data suggests that individual differences in personal meaning are reflected in appraisal processes and thereby underpin or determine how people appraise the nature of their environment (Cox & Ferguson, 1991; Payne, 1988a).

The correlational data indicates the conceptual independence of (a) the OSI stressor and personal meaning scales; (b) the spectrum of specific and more general personal meaning scales; and contrary to expectation, the independence of the Expectancy Psychological Stress and Hardiness scales. In particular, the generally weak correlations for the correspondence of personal desirability with valence and expectancy appraisal processes is unexpected. Furthermore, on the basis of both theoretical and statistical evidence (see studies one and two), it was argued that valence and expectancy appraisal processes likely fuse to form the higher order and more general personal desirability

appraisal processes (Ajzen & Fishbein, 1980). However, on the basis of the correlations between the respective scales, there is essentially no evidence to support the view that appraisals of personal desirability have their roots in the more specific valence and expectancy appraisal processes.

On the other hand, the correlations between the valence and expectancy scales do indicate a low but significant conceptual linkage between corresponding valence and expectancy appraisal processes. As the results show (see Table 3.3.5.5), the correlations between corresponding valence and expectancy scales range from a minimum of 0.23** to a maximum of 0.40** between the physical environment scales and 0.32** between the composite scales. For instance, the correlation between the composite scales indicates that the correlation explains 10.24% of the variance between valence and expectancy appraisal processes. Further, the correlations between the valence of stressors and strain are mainly not significant; conversely, although low, those between expectancy and strain are generally significant. In other words, the data would seem to suggest that stressor valence is not an important cognitive process in the prediction of strain, but rather may in effect serve a different function in the stressor to strain process.

With the exception of the Role-Responsibility scale, the descriptive data indicates that the valence of the respective scale items is significantly skewed in the negative direction and the alpha coefficients for the scales generally poor. Thus, it may be the case that the weak correlations with strain reflect the poor reliability of the valence scales. However, the transformation of skewed responses has, it would seem, little effect on the correlations with strain. Therefore, on the basis of this data and that from previous studies, there is in effect no evidence of a consistent and significant relationship between stressor valence and strain.

One logical explanation for the skewed responses to the valence items (see extensive discussion Chapter 3.2.2.8), suggests that either social or contextual "norms" may in general act to overrule the personal meaning assigned to common stressors (Williams & Clark, 1997). However, as concluded in study two, although norms for the items may influence the response to valence items, they are not necessarily the dominant factor underlying the skewed distribution of the responses. It was argued, at length, that skewness in the responses to the valence items may be seen as a direct reflection of (a) the individual's expectancies assigned to common study stressors and (b) the effect of underlying individual differences in hardiness cognitive styles. Consequently, it was concluded that the valence assigned to stressors is seemingly descriptive in nature, an indicator or cognitive label for the nature of expectancies assigned to common study stressors.

Similar to the negative skewness of the valence scales, the data for the present study indicates that the responses to the expectancy scales all reflect significant negative skewness. This suggests that some factor in common with the valence and expectancy scales determines the negative skewness of the scales. However, contrary to the explanation proffered in study two, the correlations between expectancy and hardiness are generally not significant and indicates that hardiness has no indirect relationship with valence appraisal processes. Nonetheless, the correlations between corresponding scales are significant and suggests that the valence of common study stressors reflects the nature of the expectancies assigned to common study stressors. For instance, the negative skewness in the response to the expectancy role-overload item "Being unable to accomplish the study load expected of me will cause me stress" corresponds to the negative or skewed response "Bad" for the valence item "Being unable to accomplish the study load expected of me is:" good/bad.

Previous studies (e.g., study four) have argued that the Expectancy Psychological Stress scale may be seen as a measure of personal resilience (Antonovsky, 1991) and thereby was expected to correlate moderately with the hardiness scales. However, contrary to expectations and although significant, the correlations between the constructs are both weak and inverse in nature. As a result, they suggest (a) the conceptual independence of the constructs; and (b) that increases in expectancies for psychological stress are related to a decrease in hardiness. In other words, the data indicates that expectancies for psychological stress may be seen as essentially a source of personal demand and hardiness, as essentially a mediator of personal demands. As the focus of items in each scale would seem to indicate, those in the Hardiness scale emphasise the ability of the person to act on their environment (e.g., "When I make plans I'm certain I can make them work"); and those in the Expectancy Psychological Stress scale, a passive self-evaluation of the likely effect of decrements in the person's well-being on their subsequent behaviour/performance at university (e.g., "When I am worried, I am not able to concentrate on my studies properly"). In effect, the correlations confirm that the scales measure reasonably discrete domains of personal meaning.

Consistent with those from study six, the results further demonstrate the significant mediating role of hardiness cognitive styles in strain related outcomes. As the data indicates, the hardiness dimensions contribute significant information to the explained variance in models of best fit. Further, when used as the common or more general cognitive process in hierarchical analyses (see Table 3.3.5.19), the incremental effect of commitment and control appraisal processes, account for nearly half (i.e., 27.29% - 26.56% adj) the cumulative variance explained by the model (i.e., 53.35% - 51.69% adj).

The mediating role of individual differences in hardiness is further evident from the relative effect of low and high hardiness cognitive styles in the stressor to strain process. As the results show, dispositions for low and high hardiness seemingly discriminate the functional importance (i.e., act to either inflate or suppress the importance of cognitive processes) of recognition, coping and personal meaning cognitive processes in the transactional relationship between stressors and strain. In addition, they show that dispositions for high hardiness act to constrain the amount of variance in strain explained by the predictors of strain in the model.

In effect, the results for low and high hardiness suggest that two discrete models of stress may be used to explain the transactional relationships underlying stress and strain. One a cognitive imbalance model of stress which reflects the effect of low hardy cognitive styles on the functional role of cognitive processes in the stressor to strain process; the other, a dispositional model of stress which reflects the personal efficacy of high hardy cognitive styles to appraise (a) sources of stress and (b) the stressor to strain process (Kobasa, Maddi & Kahn, 1982).

Seemingly those with low hardy cognitive styles act to inflate the functional importance of recognition and appraisal cognitive processes in the transactional process underlying stressor to strain outcomes. As the results suggest, low hardy persons would seem, have an acute awareness of (a) their current status of well-being, (b) their environment, (c) their ability to control the environment, and (d) the use of Rational/Cognitive coping strategies to cope with sources of stress and personal strain. Given these results, low hardy individual's it would seem, place an increased emphasis on (a) the recognition and appraisal of common stressors and (b) the use of coping strategies to reduce or counteract sources of stress and symptoms of strain.

For the dispositional model of stress, however, the data indicates that those with high hardy cognitive styles have an acute awareness of (a) their personal well-being; (b) the presence and effect of social support demands and (c) a sense of purpose from their personal commitment to life events such as work and study. Thus, on the basis of these results, high hardy person's seemingly (a) elevate the importance of specific personal meaning and commitment appraisal processes; and (b) suppress the importance or relevance of recognition, personal desirability, control and coping cognitive processes to assess the personal importance of common stressors and in the stressor to strain process. In other words, their resilience and personal efficacy is embodied in their ability to both appraise, reappraise and confront the significance of their personal well-being and demands of environmental events (Kobasa, 1979; Kobasa et al., 1982). As Kobasa et al. (1982) similarly argue:

> Specifically, they are those (i.e., personality dispositions) that have the cognitive appraisal effect of rendering the events (i.e., stressful life events) as not so meaningless, overwhelming, and undesirable, after all, and the action effect of instigating coping activities that involve interacting with and thereby transforming the events into a less stressful form rather than avoiding them (p. 169).

Further, and relevant to the principal aim of this thesis, due to the substantial differential in the variance explained by the low and high samples, the data indicates that individual differences in hardiness cognitive styles constrain the amount of variance in strain explained by recognition and personal meaning cognitive processes. In other words, it indicates (a) the necessity to account for the effect of dispositional factors in the magnitude of the variance in strain explained by a model; (b) that a cognitive imbalance model of stress is likely to explain the greater percentage of the variance in symptoms of strain; and (c) that low and high hardy cognitive styles may be used to discriminate the vulnerability of individuals to sources of stress (Appley & Trumbull, 1986; Lazarus, 1987, 1995).

With respect to the Personal Desirability scale, the results further illustrate (a) the relative significance of the more general personal desirability appraisal processes in the prediction of physical and composite strain; and (b) the theoretical importance of personal desirability appraisal processes when placed in the presence of significant hardiness, common stressor, coping and personal meaning cognitive processes. As a result, there was support for the hypothesis H2 that the personal desirability assigned to common study stressors would add significant information to the explained variance in strain when placed in the presence of significant predictors of strain. Thus, taken together, these results further highlight the importance of personal meaning processes in the explanation of the variance in symptoms of strain.

In addition, the results further show the significant correspondence between the appraisal of an imbalance (balance) with sources of stress and symptoms of strain. As the data indicates, the personal desire for more or less of a common stressor; or alternatively, the personal satisfaction with a common stressor each explain a significant percentage of the variance in physical, psychological and composite symptoms of strain. For instance, the personal desire for more role-ambiguity stressors (e.g., "Clear directions from lecturers and tutors") explains 11.69% (11.25% adj) of the variance in composite strain; personal satisfaction with role-ambiguity and role-insufficiency stressors an increased and moderate 14.14% (13.29% adj) of the variance in composite strain; and the personal desire for less role-boundary stressors, a low 4.69% (4.22% adj) of the variance in symptoms of composite strain.

Furthermore, the results suggest that individual differences in the personal desirability of common study stressors may be seen to underpin the direction and intensity of the responses to (a) items in the Personal Desirability scale (see Appendix 1.1.2, Table G.3); and (b) the "Like More" "About Right" and "like Less" anchors of the Personal

Desirability scale (see Appendix 1.1.3, Table G.4; Appendix 1.1.4, Table G.5). Accordingly, it is likely that the response to scale items follows two stages of appraisal. First, there is the response to the scale item using the tripolar anchors as the frame of reference to appraise the direction of the imbalance (balance) with the item; second, there is the appraisal of the direction and intensity of the personal imbalance (balance) with the chosen response anchor. Thus, in sum, there are four evaluative response scales embodied in the design of the Personal Desirability scale which may used to extract measures of personal imbalance (balance) with common stressors.

The distribution of the responses to both the Personal Desirability scale and the "Like More" "About Right" and "Like Less" anchors, however, tend to be skewed in the positive direction and suggest that individual differences in personal desirability may account for the skewed distributions. That is, the responses are skewed toward the centre or "About Right" pole of the scale. Moreover, they indicate that a higher than expected 36.76% of the responses to scale items fall within the "Like More" segment of the scale; a less than expected 46.26% in the "About Right" section of the scale; and an expected 16.97% in the "Like Less" segment of the scale. In effect, the responses do not reflect a normal distribution and furthermore, suggest that a majority of participants have a personal desire for more common study stressors; conversely, that a lower than expected (i.e., 68.26%) number are satisfied with the nature of common study stressors.

One alternative and logical explanation for the skewed data is that social and/or contextual norms or social expectancies for common study stressors override the personal desirability of common stressors and thereby effect a common response to the stressor item (Ajzen & Fishbein, 1980; Hesketh & Gardner, 1993). For instance, the responses to the Role-Responsibility scale are significantly skewed in the positive direction (i.e., skew = 1.141) and suggests that norms for responsibility may account for the skewed

responses. For instance, the item "Leadership" is likely valued by social groups or seen as a desired position in social contexts. However, the high skewness coefficient for the scale may in effect be somewhat misleading. Contrary to the skewness data, the percentage of responses to each anchor of the scale approach the expected values for a normal distribution (see Appendix G.1.1.3, Table G.4) and the response distributions for each anchor (see Appendix G.1.1.4, Table G.5) indicate a wide range of responses to each anchor of the scale. Furthermore, when the response distribution for the scale is broken into its discrete components, they indicate that the participants discriminate the desirability of role-responsibility in terms of "like More" "About Right" and "Like Less". In other words, the data suggests that rather than a normative response to the items in the scale, individual differences underpin the response to the Role-Responsibility scale. Similarly, the frequency of responses to the Role-Ambiguity and Role-Insufficiency scales indicate that the responses are highly skewed toward the "Like More" pole of the scale. Thus, again, it may be the case that the social/contextual norm for the items distorts the response distributions. However, although only a small number of responses fall in the "Like Less" segment of both scales, the responses to the "Like More" anchor of both scales are normally distributed and those for the "About Right" anchor of the scales, positively skewed and reflect the range of the scale. In effect, the participants discriminate the items in terms of "Like More" and "About Right" and suggests that the responses to the items reflects the effect of individual differences in the personal desirability of the respective items. In this case, the majority of the participants have a high desire for more role-ambiguity (i.e., guidance and information) and role-insufficiency (i.e., use of talents, need for success, career prospects) common stressors.

Nonetheless, despite the evidence of significant skewness in the response to "Like More" "About Right" and "Like Less" scales, each scale explains a significant percentage of the variance in physical, psychological and composite symptoms of strain. This indicates that people are both able and do discriminate (i.e., appraise) the personal desirability of common study in terms of "Like More" "Like Less" and "About Right". As a result, there is support for the hypothesis H3 that the measurement of common stressors in terms of desirable, undesirable and congruence of stressors will each explain a significant percentage of the variance in symptoms of strain. Thus, on the basis of this result, there is, it would seem, a strong relationship between the recognition of common study stressors and the personal desirability of common study stressors. Seemingly, the greater the discrepancy (i.e., transactional imbalance) between common sources of stress and the person's values/goals, the stronger is the personal concern for the "actual-ideal" discrepancy and the resultant symptoms of strain.

Furthermore, it could be argued that the significant skewness in the responses to the Personal Desirability scale depreciates or invalidates the imbalance approach to the measurement and prediction of strain. But not so, the results illustrate the inherent versatility and specificity embedded in the imbalance approach to measurement. In particular, they show the specificity qualities of the scale. That is, the range of responses to each anchor of the evaluative scale may be used to predict strain. In addition, they demonstrate the potential utility of the scale as a diagnostic of (a) the social expectations and norms of the social context, (b) the values and goals of individual's, (c) the personal satisfaction/dissatisfaction with common stressors, (d) common environmental stressors and (e) job design. For example, skewed distributions may in effect reflect the social/ contextual norms of the sample; responses to the "About Right" anchor, the level of personal satisfaction with common sources of stress; and responses to the "Like

More" and "Like Less" anchors of the scale, a guide to (a) the values, goals and expectations of individual's, (b) the personal relevance of common stressors and (c) deficiencies in the design of work.

In addition, and similar to the data for studies five and six, the results show a linkage or correspondence between the magnitude of the personal desirability of stressors and symptoms of strain. Further, when seen in transactional terms, they indicate some support for the transactional tenet that the appraisal of an imbalance between actual and ideal stressors results in stress and the translation to symptoms of strain. As the descriptive and graphical data for the Composite Personal Desirability and Role-Responsibility Personal Desirability scales show, for increases in the personal desire for "more" or "less" of common study stressors, there is generally a corresponding increase in symptoms of strain. Conversely, for increases in the personal satisfaction with stressors, there is generally a steady decline in symptoms of strain.

On the basis of the data, then, there is, it would seem, a linear correspondence between both the (a) desire for more of a stressor and (b) satisfaction with a stressor and symptoms of strain. Further, this suggests that there are no psychological restrictions on the magnitude of the personal desire for "more" or "less" of a stressor; or conversely, personal satisfaction with a stressor and the associated increase or decrease in symptoms of strain respectively. Therefore, although restricted to the limitations of descriptive data, there is support for the hypothesis (H4) that increases in the desire for more or less of a common stressor relate to increases in symptoms of strain; and increases in the satisfaction with a common stressor, to decreases in symptoms of strain.

In addition, the study sought to demonstrate that for equivalent levels of an appraised imbalance or balance with stressors (e.g., imbalance and satisfaction scores related to the highest 50% of the sample), there are significant differences between the corre-

sponding mean strain scores. As the graphical data indicates, there is a noticeable separation between the mean strain scores corresponding to equivalent levels of appraised imbalance and balance with stressors. When the means for strain are compared statistically (see Table 3.3.5.27 & Appendix G.3, Tables G.16, G.17), there are generally significant differences between the mean strain scores corresponding to equivalent levels of personal satisfaction and personal imbalance with stressors. In other words, the data indicates that individual differences may be seen to underpin the appraisal of stressors in terms of their personal desirability and the reported frequency of physical, psychological and composite symptoms of strain. Indeed, they show that people are both able and do effectively discriminate the personal desirability of stressors. Furthermore, they demonstrate that the nature and intensity of the personal imbalance (balance) with common stressors has a direct or unique correspondence with levels of personal strain. Thus, on the basis of this data, there was support for the hypothesis H5 that mean strain scores corresponding to given levels of both the desirability and undesirability of stressors would be significantly higher than the mean strain scores for equivalent levels of congruence (i.e., satisfaction) with stressors.

When seen in nomothetic terms, the results demonstrate that the methodology used in the present study both triangulates and replicates the findings from previous research. That is, the study sought to show that the intensity (i.e., perceived pressure) of common stressors predicts variance in strain which is comparable to that explained by the frequency of common stressors. Furthermore, it also sought to show that the results obtained from measures of specific and more general personal meaning, coping and hardiness cognitive processes replicate those from previous studies. The magnitude of the variance explained by intensity measures of common stressors may, however, be some-

what misleading due to the increased sample size for the present study. Alternatively, the significance of their effect in corresponding models of stress provides a more valid method by which to compare alternative measures of common stressors.

Similar to the results from previous studies (e.g., study one) which used a frequency approach to measurement, the relative effect of the OSI common stressors accounts for a significant percentage of the variance in strain explained by models of best fit. However, in contrast, to the results for study one, the pressure of common stressors is not the most powerful predictor of strain in the model. Furthermore, the result is achieved using a generic or composite measure to represent dimensions of OSI common study stressors. As a result, the study was unable to identify the relative importance of specific dimensions of common study stressors in the stressor to strain process. Nonetheless, on the basis of the results for the present study, it can be concluded that the study essentially triangulates (Cox & Ferguson, 1994) those from previous studies. That is, within the limits of the generic scale, it shows that measurement of common stressors in terms of pressure is a valid alternative to frequency measures of common stressors.

With respect to the replication of results across samples and contexts, the results for the present study are in the main comparable with those with previous studies. Similar to those for studies one and two, stressor valence is not a significant predictor of strain. As a result, it can be concluded that valence appraisal processes have no significant involvement in the stressor to strain process. Further, in contrast to the significant but rather low percentage of variance explained by expectancy scales in studies one, two and three, the relative effect of expectancies for common stressors were not significant predictors of strain in the models of best fit. Thus, the findings of the study fail to

replicate those from previous studies and indicates that the expectancy assigned to common stressors has either little or no relative importance in the transactional explanation of the stressor to strain process.

Conversely, the results for the present study indicate that the significance of (a) expectancies for psychological stress, (b) beliefs associated with social support demands, (c) the personal desirability of common stressors, (d) coping strategies and (e) hardiness in the models of best fit replicate those from previous studies. Specifically, the significance of the Expectancy Psychological Stress and Belief Social Support scales in the models replicate those from study four; the relative effect of the Personal Desirability scale in the models, those from studies five and six; the significance of the PRQ coping scales in the models, those from studies one and four; and the relative importance of the hardiness scales in the models of best fit, the results of study six. In addition, the significant effect of the "Like More" "About Right" and "Like Less" personal desirability sub-scales on strain, replicates the results from studies five and six. Hence, given the consistency of these results across the present and previous studies, it may be concluded that (a) these cognitive processes contribute both unique and significant information to the transactional process underlying stress and strain; and (b) these scales may be seen as nomothetic or global measures of the respective constructs.

Thus, when seen in total, the studies show that the recognition of common stressors is invariably a common predictor of strain in each study. In addition, they demonstrate that dispositions for hardiness and the use of coping strategies are consistent predictors of strain across the models. Furthermore, and the most relevant to the aim of this thesis, they show that for each study, specific and/or more general personal meaning appraisal processes account for a significant percentage of the variance in strain explained by the measurement model.

In summary, the findings of the study further demonstrate that the personal meaning assigned to sources of stress significantly improves the explanation and understanding of the transactional process underlying symptoms of strain. In particular, they identify the relative effect from expectancies for psychological stress as the most powerful predictor of strain in the models of best fit. Furthermore, they indicate that following the removal of variance common to hardiness cognitive styles, the variance in strain explained by recognition cognitive processes is approximately equal to the variance explained by specific and more general appraisal processes. In other words, this finding refutes the claim that the recognition of common stressors is the dominant cognitive process underling the stressor to strain process (Payne et al., 1988). Indeed, the results from hierarchical modelling demonstrate that appraisal processes explain the greater percentage of the variance in symptoms of strain. Accordingly, they indicate that measures of specific and more general personal meaning may be used to "personalise" the measurement and explanation of the stressor to strain process.

The results further demonstrate the mediating role of hardiness cognitive styles in the stressor to strain process. In addition, they show that dispositions for low and high hardiness discriminate the functional importance of recognition and appraisal processes in the relationship between stressors and strain. Those with low hardiness, it would seem, inflate the importance of recognition, appraisal and coping cognitive processes; conversely, those with high hardy cognitive styles, suppress the importance of recognition, personal desirability and coping cognitive processes. As a result, the data suggests that two models of stress may be used explain the stressor to strain process. One a cognitive imbalance model of stress which emphasises the functional role of cognitive process in the relationship with strain; the other, a dispositional model of stress which reflects the

efficacy of high hardy cognitive styles (i.e., the efficacy of control, commitment & challenge appraisals) to mediate the importance or negative effect from sources of stress in symptoms of strain.

Perhaps the more pertinent to the principal aim of thesis, the hardiness data indicates that individual differences in hardiness influence the magnitude of the variance in strain explained by the model. The effect of high hardiness causing a 50% reduction in the variance explained by model. Thus, there is, it would seem, a need to account for the effect of dispositional factors in (a) the understanding of the stressor to strain process, and (b) the magnitude of the variance explained by the model. Further, the data indicates that hardiness may be used as screening medium to identify individual's who are more likely vulnerable to stress.

Furthermore, the results illustrate that an imbalance approach to measurement enables an instructive insight to the nature of individual differences underlying the personal desirability of common study stressors. Specifically, they show that the appraisal or personal meaning of common study stressors in terms of "Like More" "Like Less" and About Right" each explain a significant percentage of the variance in strain. In short, the results demonstrate that an evaluative approach to measurement may be used to discriminate the nature of common stressors as either an undesirable facet of the environment or a source of personal satisfaction. Furthermore, this suggests that the evaluative scale may be used as both a measure of change and diagnostic for job design.

In addition, the findings indicate that the personal desirability of stressors (i.e., undesirable or personal satisfaction) is linked to (a) increases in the magnitude of strain related outcomes and (b) significant differences between mean strain scores corresponding to given levels of personal desirability. Seemingly, people are able and do

discriminate the personal meaning of common stressors as either an undesirable source of stress or alternatively, as a source of personal satisfaction; moreover, these personal distinctions of stressors ultimately correspond to either higher or lower levels of strain.

A triangulation approach to measurement was used to cross-validate the relative effect of common stressors on strain in the measurement model. From this comparison, it was concluded that the significance of common stressors measured in terms of intensity (i.e., perceived pressure) is essentially equivalent to the significance of common stressors when measured in terms of frequency in the models of best fit. However, as the comparison was based on the significance of common stressors in the model, it leaves open the question as to which method of measurement is the superior predictor of strain. Alternatively, it may be the case that the duration of common stressors is the more powerful predictor of strain (Dewe, 1991a; Osipow & Spokane, 1983, 1987).

The results associated with the replication of findings from previous studies demonstrate the consistency of coping, hardiness, personal desirability, expectancies for psychological stress and belief social support cognitive processes as significant predictors of strain across contexts and samples. As a result, this spectrum of cognitive processes may be seen to add significant information to the mental algorithm underlying the appraisal of an imbalance between actual and ideal sources of stress and the resultant strain related outcomes. Further, they illustrate that the respective scales may be used as nomothetic or global measures of the respective constructs (Barratt, 1971). By contrast, the valence of common stressors is generally a non-significant predictor of strain and the expectancy of common stressors a both inconsistent and weak predictor of strain. This indicates that these appraisal processes have low importance in the transactional explanation of the stressor to strain process. As a result, they would seem to serve no useful purpose in the measurement and explanation of occupational stress.

4.5.5.1 Conclusion From Results

The results show that just over 50.0% of the variance in composite strain is explained by dimensions of personal meaning (i.e., individual differences), their physical coping (i.e., self-care) style and their self-report of common occupational stressors. Of this explained variance, dimensions of the individual were found to account for 74.00% of the variance explained by the model and recognition cognitive processes, 26.00% of the variance explained by the model. This result, however, is likely to be somewhat misleading as the proportion of the variance explained by personal meaning cognitive processes fails to account for the variance that is common to descriptive cognitive processes. Therefore, to further explore the unique effect of the appraisal process on the variance in strain, a series of factor analyses and hierarchical regression analyses were used to establish the independence and unique effect of general and specific appraisal processes in the model. Results for the factor analyses are shown in Appendix G.5 (see Table G.19); and the results previously presented in Table 3.3.5.20, the incremental effect of (a) specific and general appraisal processes and (b) general appraisal processes on the variance in strain explained by the model.

Results for the factor analyses demonstrate support for the assumption that appraisal processes may be seen to fall on a continuum that ranges from specific to general (see discussion Chapter 2.1.2 and 2.3.6). The factor solution with varimax rotation identified two independent factors which account for 60.10% of the variance in the model. The more general dimensions of hardiness cluster on the first factor and the more specific dimensions of appraisal on the second factor. A subsequent factor analysis of the 15 items in the three personal meaning scales loading on the second factor was used to

confirm the item structure and support for the conceptual independence of these scales. That is, the factor solution was found to replicate the structural nature of the respective scales.

The results from hierarchical modelling demonstrate that the incremental or unique effect of specific and general appraisal processes accounts for a significant 24.71% (23.75% adj) of the 53.34% (51.69% adj) of the variance explained by the model; that is, in proportional terms, 45.95% of the explained variance. In addition, a subsequent hierarchical model indicates that the unique effect of general appraisal processes account for 9.04% (8.78% adj) of the variance explained by the model; or in proportional terms, 16.94% of the explained variance. Thus, taken together, these analyses indicate that dimensions of appraisal account for approximately 50.0% of the variance explained by the model. Furthermore, they demonstrate the significant and functional involvement of the personal meaning assigned to sources of stress (i.e., the role of individual differences) in the nature and explanation of the transactional relationship underlying strain related outcomes. Moreover, if seen at the conceptual level, they demonstrate support for the importance and functional involvement of the appraisal process in the mental summation of the imbalance between actual and ideal stressors and the relationship with the variance in symptoms of strain.

The main limitation of the study, however, was the length of the questionnaire. Its surreptitious effect , if any, on the responses to scale items (e.g., mental fatigue, boredom, disinterest with the task, time constraints and carry-over effects) is difficult to identify. There is no obvious increase in random or non-random missing values, decline in the reliability of the scales or increase in the skewness of scale responses toward the end of the inventory. However, even though the majority of participants had the opportunity to earn credits toward their courses of study, the fact remains that only

51.75% of the participants returned completed questionnaires. Hence, there is the inference that either the bulk of the inventory was a deterrent to participants or perhaps the content of the questionnaires was threatening to some participants.

Directions for future research relate to three points. First there is need to further explore the role of expectancies for psychological stress in the transactional model. Its relative effect on the explanation of strain was somewhat contrary to the results from study four and suggests the necessity to verify the importance of this appraisal process in the stressor to strain process. Second, the results indicate that the measurement of common stressors in terms of intensity (i.e., pressure) triangulates the measurement of common stressors in terms of frequency. However, the relative efficiency or the ability of the scales to predict strain remains unclear. In addition, the generic nature of OSI scale suggests that conceptual redundancy within the scale devalues its validity as measure and predictor of symptoms in strain. Hence, on the basis of these points, there is a need to (a) clarify the conceptual structure of the OSI common stressor scale (Williams & Cooper, 1998) and (b) identify the relative efficiency of intensity and frequency measures of common study stressors as predictors of strain. Third, to further confirm the relative importance of specific and more general appraisal processes in the transactional model, there is a need to replicate the findings of the present study in an applied setting. However, considering the poor or insignificant effect of stressor valence and stressor expectancy measures of common stressors in the stressor to strain process, these scales should be eliminated from the measurement model. As a result, their elimination will (a) reduce the bulk of the inventory to a more acceptable 192 items; and (b) likely increase the validity of the responses to scales in the inventory.

Chapter Four

General Discussion

Chapter Four

4.1.0 Introduction

This chapter provides a general discussion and critical evaluation of the results from seven empirical studies which explore the measurement, conceptual independence and relative importance of personal meaning (i.e., expectancy, valence, belief and desirability) and cognitive style dimensions of appraisal in the transactional nature of stressor to strain outcomes.

The chapter first provides a summary of the variance in strain explained by each study from the effect (i.e., unique or relative) of specific and cognitive style dimensions of appraisal in the respective models. It then describes a revised model of the measurement dimensions of appraisal (see Chapter 2.1.2 & Figure 2..1.1a) which reflects the relative effect and functional role of appraisal processes in the stress to strain relationship. The chapter then presents an *individualised* model of occupational stress which incorporates the results from this body of research; and following this, a discussion of the four key domains of self-report measurement which underpin the conceptual nature of this transactional model of occupational stress. It then considers the theoretical and practical utility of the findings from the research programme; and following this, provides a brief discussion of the conceptual and measurement issues which act to effect the measurement, validity and advancement of stress research. The chapter then offers recommendations for the direction of future research; and finally, provides a summary of the main conclusions that may be drawn from the results of the research programme.

4.2 Summary of the Results

Table's 4.1 and 4.2 provide a summary of the results from a sequence of studies which sought to explore both the relative and unique effect of (a) the personal meaning assigned to sources of stress and (b) personality cognitive styles on the explained variance in symptoms of strain.

Across the studies, the results indicate that the inclusion of personal meaning dimensions of appraisal in the measurement of the stressor to strain process consistently effect a significant increase in the explained variance of strain. For example, in comparison to the 30.44% (adj) of the variance in strain explained by the recognition of common stressors in study one, the results for study seven indicate that the cumulative effect from common stressor (i.e., recognition) and personal meaning sources of stress explains a substantially higher 37.84% (adj) of the variance in strain. In comparison, the model of best fit for the study explains a substantially higher 51.69% (adj) of the variance in symptoms of strain from the cumulative effect of common stressor and personal meaning sources of stress, coping behaviours and dispositional cognitive styles.

When the results for the unique effect of dimensions of appraisal are seen in proportional terms, however, they provide a more instructive insight to the importance of the appraisal process in the stressor to strain relationship. For example, from the results of study four, measures of personal meaning account for an estimated 83.25% of the variance in strain explained by the recognition/personal meaning model; and an estimated 64.57% of the variance in strain explained by the model of best fit. By contrast, the results for study seven indicate that dimensions of personal meaning account for an estimated 24.28% of the variance in strain explained by the recognition/personal meaning model; and the cumulative effect from dimensions of personal meaning and cognitive style, 45.95% of the variance in strain explained by the model of best fit.

Table 4.1
Summary of Variance in Strain Explained by Recognition, Personal Meaning and Cognitive Style Dimensions of Cognition

Study	Percentage of Variance in Strain Explained by Model (Adjusted)										
	Recognition (Baseline) and Unique Effect of Personal Meaning and Cognitive Style Dimensions of Appraisal							Recognition/ Appraisal		Proportional Effect#	
	Recn	Expect	Valen	Belief Soc S	Expect Strn	Desir	Cognit Style	Recn/ Pers	Best Fit	Recn/ Pers	Best Fit
Study 1											
Independ Scales	30.44	4.91	NS	----	----	----	NS	35.47	41.48	13.84	3.71#
Sem Sim Scales (n = 148)	14.61	6.29	----	----	----	----	----	20.53	----	43.86	----
Study 2											
Sht Form Scales (n = 77)	20.54	3.42	NS	----	----	----	----	22.21	23.96	24.49	14.27
Lng Form Scales (n = 72)	31.34	14.82+	NS	----	----	----	----	----	----	47.28#	----
Study 3 (n = 63)	12.31	4.18	----	----	----	----	----	16.49	16.49	25.35	25.35
Study 4 (n = 132)	4.46	NS	----	2.16	NS	----	4.64*	26.62	56.59	83.25#	64.57#
Study 5 (n = 133)	----	----	----	----	----	20.99+	----	----	----	----	----
Study 6 (n = 162)	21.94	----	----	-----	----	4.04	16.93#	23.59	40.52	6.99#	83.17#
Study 7 (n = 205)	28.65	NS	NS	2.03*	6.63*	1.54	8.78	37.84	51.69	24.28#	45.95
Mean Variance (n = 124)	20.54	3.13	0.00	2.10	3.32	2.79	7.59	26.11	38.46	33.66	39.50

Note: a) NS - Not Significant in Model; b) Proportional Effect# - Proportion of Variance in Strain explained by Specific and Cognitive Style Appraisal Processes; c) Recn/Pers - Cumulative Effect of Recognition and Specific Personal Meaning predictor variables; d) Independ - Independent, Sem Sim - Semantically Similar Scales; e) # - Estimate Calculated From Difference Between Models or Alternatively, Incremental Steps in Hierarchical Models; f) + Baseline or Independent Effect (i.e., Not Unique); g) *Squared Part Correlation (i.e., Semipartial) From Final Equation of Model of Best Fit.

Furthermore, when the results from the studies are summarised in average values, they indicate that common stressors on average explain 20.54% (adj) of the variance in strain; personal meaning dimensions of appraisal, 2.835% (adj) of the variance; and appraisals of cognitive style, a much higher 7.59% (adj) of the variance in strain. Thus, in proportional terms, dimensions of personal meaning on average account for 33.66% of the variance in strain in the presence of common stressors; and dimensions of specific and general appraisals, an increased 39.56% of the variance in strain when in the presence of common stressor and coping dimensions of cognition. Further, when the results are seen in transactional terms, they indicate the importance and functional role of the appraisal process in the mental summation of the imbalance between actual (i.e., recognition of common stressors) and ideal (i.e., in terms of expectancy, valence, personal belief and personal desirability) sources of work stress and strain outcomes.

The results in Table 4.2 indicate that the personal desirability of stressors in terms of "Like More" "About Right" and "Like Less" each consistently explain a significant percentage of the variance in strain. That is, they demonstrate that imbalance measures of appraisal may be designed to explore the person's evaluation of balance (imbalance) with a source of stress (Cox, 1985a).[1] The data for evaluations of "Like More" and "Like Less" show that the appraisal of a personal imbalance with a stressor (i.e., $\approx \geq 1.0$ SD from the mean) reflects as stress and symptoms of strain. Conversely, the appraisal of "About Right" or balance with stressors was found to indicate personal satisfaction with the nature of stressors and hence, less symptoms of strain. Consequently, there is

[1] Note: The bipolar response scales used to measure valence (i.e., "Good - Bad"), expectancy (i.e., "Likely - Unlikely") and personal belief (i.e., "Most of time - Rarely or never") may be seen as measures of appraisal with an underlying response continuum which ranges from positive to negative (see Chapter 3.3.1.2). Therefore, although these scales measure the personal imbalance (balance) with a source of stress, they are essentially linear measures of appraisal. In effect, they tap only one pole of the appraisal process - the "satisfaction - overload" dimension of appraisal (Cox, 1985a; Cox et al., 1990).

empirical evidence to suggest that occupational stress may be seen as the reflection of a *value conflict* transaction with the nature of the person's environment; and the outcome of job satisfaction as a *value satisfaction* transaction between the needs, values and expectancies of the person and their environment. In essence, then, there is the inference that a *value discrepancy model* may be used to conceptualise and operationalise the measurement and explanation of occupational stress and job satisfaction. In other words, the imbalance data indicates that occupational stress and job satisfaction may in effect be conceptualised in motivational terms - as the personal resolve of thwarted or satisfied motives respectively (Lazarus et al., 1952; Locke, 1969, 1976, 1984,).

Furthermore, if the imbalance results are seen in cognitive terms, they show that people have the cognitive ability to reliably discriminate the personal desirability of work demands. As a result, there is evidence to suggest that the mediational role of individual differences may be seen to (a) underpin the personal appraisal of common work stressors; (b) underlie the direction and intensity of the personal desirability assigned to work stressors and the subsequent relationship with strain. In addition, when the imbalance data is seen in transactional terms, it indicates support for the transactional view of occupational stress. For instance, if the results are taken as representing a *slice in time* or "snap shot" (Cox & Ferguson, 1991, p. 8) of the transactional process, they demonstrate that it is indeed possible to operationalise personal desirability dimensions of appraisal as the basis to achieve an improved understanding of occupational stress.

Further, there is empirical evidence to support the fundamental postulate underlying the transactional view of occupational stress (Cox, 1978, 1985a; Cox & MacKay, 1981). The data demonstrates that the appraisal of an imbalance between actual (i.e.,

recognition) and ideal (i.e., personal desirability in terms of "Like More" and "Like Less") common work stressors is related to psychological stress (i.e., cognitive dissonance) and symptoms of strain.

Moreover, from a methodological standpoint, the results reveal the inherent ability (and applied utility) of evaluative measurement to discriminate (a) the direction and intensity of the individual's appraisal of work stressors and (b) the correspondence with strain related outcomes.

Table 4.2
Summary of Variance in Strain Explained by Categories of Personal Desirability, Dimensions of Hardiness Cognitive Styles and Categories of Personal Hardiness

Study	Percentage of Variance in Strain Explained by Model (Adjusted)								
	Categories of Personal Desir			Dimensions of Hardiness				Categ of Hard	
	Like More	About Right	Like Less	Cont	Comm	Chall	Hard	Low	High
Study 5 (n = 133)	17.41	19.61	15.71	----	----	----	----	----	----
Study 6 (n = 162)	15.43	15.82	3.35	14.97*	NS	4.21*	24.53*	30.25 (n = 54)	13.82 (n = 55)
Study 7 (n = 205)	11.25	13.29	4.22	1.18*	2.72*	NS	8.30*	51.68 (n = 51)	25.06 (n = 53)
Mean Variance	14.69	16.24	7.76	8.08	1.36	2.11	16.42	40.97	19.44

Note: a) NS - Not Significant in Model; b) *Squared Part Correlation (i.e., Semipartial) From Final Equation of Model of Best Fit; c) Results for Models of Best Fit With Hardiness in the Model - Refer Footnotes in Results For Studies Six and Seven.

The results obtained from the appraisal of stressors in terms of "Like More" "About Right" and "Like Less" may also be compared with those from P-E fit research. For the P-E fit approach to stress research, the derivation of indices for P-E fit (i.e., imbalance scores representing stress) are derived from the algebraic summation of P and E scores. These indices are then used to account for variance in strain beyond that explained by P and E variables. Using this method, French et al. (1982) were able to show that indi-

ces of P-E fit account for an additional 1.5% to 14.0% of the variance in dependent measures. In comparison, the results for the imbalance approach to measurement are, on average, comparable if not superior to those obtained from P-E indices of fit. For instance, on average imbalance measures for "like More" explain 14.69% (adj) of the variance; those for "like Less", a much lower 7.76% (adj) of the variance in strain and those for balance or "About Right" with stressors, a slightly higher 16.24% (adj) of the variance;. Further, when the effect of personal meaning (i.e., appraised imbalance between actual and ideal demands) is seen in unique terms, the appraisal of a personal imbalance (balance) with expectancy, personal belief and personal desirability sources of stress on average explain a unique 2.835% (adj) of the variance in strain (see Table 4.1). Furthermore, in contrast to the use of complex arithmetic indices of fit, these results for imbalance measurement reflect the individual's actual mental summation of their degree of personal fit between actual and ideal work demands.

Marshall and Cooper (1979, 1981) used an alternative approach to examine the nature of P-E fit and its relationship with strain. They sought to show that the "relative importance" of the relationship between job pressures and the level of personal satisfaction with the associated job pressure enable the basis for an improved explanation of the causal factors underlying managerial stress (p. 55). In this study, however, in place of calculating arithmetic indices of P-E fit from the algebraic addition of the scores for work pressure and personal satisfaction, statistical regression techniques were used to identify the relative importance of the variables when in the presence of each other. However, contrary to the hypothesis for the study that personal satisfaction would

contribute useful information to the explained variance, the results for the total sample show that the relative effect from factors of satisfaction (i.e., when in the presence of job pressures) were not significant predictors of either anxiety or physical ill-health.

One logical conclusion from the findings of the Marshall and Cooper study is that the use of a measurement scale in which balance is implicit in the response format (i.e., 0 - 5 response format), rather than explicit, has a restricted focus and therefore is essentially unable to capture the totality of the person's transactional relationship with job pressures. Measures of personal satisfaction, it would seem, may be seen as essentially measures of balance (i.e., "About Right") and thereby act to (a) restrict the individual's frame of reference and (b) fail to account for the variability or full range of the individual differences underlying the appraisal of job satisfaction. In contrast, the results for the present research show that an imbalance (i.e., evaluative) or tripolar approach to the measurement of personal desirability allows the respondent to express the nature and intensity of their unique correspondence with a source of stress. As such, it (a) lends support to the versatility embedded in the evaluative approach to measurement and (b) shows that individual differences underlying the personal meaning ascribed to stressors (i.e., degree of P-E fit) account for a significant percentage of the variance in symptoms of strain.

Taken overall, the results obtained from measures of the personal meaning assigned to stressors (i.e., expectancy, personal belief and personal desirability) are in accord with the reasoning of both Kaplan (1983) and Hobfoll (1988) on the measurement and confounding of the cognitive imbalance between P and E. They argue, one solution to eliminate the confounding of P and E elements and the associated necessity to calculate

arithmetic indices of fit, is to move the focus of measurement to the gestalt of the appraisal process. As Kaplan argued in his thesis on the role of "disvalued circumstances" in the process of psychological distress:

> In presenting this framework I do not maintain the integrity of the concepts of role strain, life events, coping mechanisms and social support. If the process of psychosocial stress as it is conceptualised here is to be understood it is necessary to disaggregate the complex meanings associated with the constructs (p. 255-256).

Hobfoll (1988) from a more recent review of Kaplan's theory of psychosocial stress and the problems of P and E confounding, however, presents a more explicit and instructive insight to Kaplan's theoretical position on the measurement of an appraised imbalance (balance) between actual and ideal (i.e., valued states) demands. He concludes:

> This may be why Kaplan sidesteps the balance issue and moves directly to the total gestalt appraisal point in the stress process. That is, may be he is correct in assuming that the balancing is done internally and as such can only be inferred to be occurring. If this is the case, the final appraisal, rather than a breakdown into its balance components, may be the best point of scientific departure (p. 20).

For instance, as shown by the results from the categorical measures of personal desirability, the use of an evaluative approach to measurement obviates the need to calculate measures of fit from P and E scores and transform the resultant indices to approximate linearity (French et al., 1982). In addition, it provides the individual with the basis to indicate the direction and intensity of the personal meaning ascribed to the discrepancy between facets of work and personal values. Seemingly, on the basis of this imbalance data, the individual's mental summation (i.e., evaluation) of the imbalance (balance) between actual and ideal demands is reflected in the nature of the personal meaning they assign to work stressors (i.e., their degree of psychological fit in the work context).

In addition, Table 4.2 indicates that dimensions of hardiness account for a significant percentage of the variance in strain. In particular, the data suggests that the individual's self-evaluation of personal control is perhaps the more important dimension of appraisal underlying their more general cognitive style. Those for commitment and challenge dispositional styles, however, are less consistent predictors of strain. This suggest that either or both these dimensions of hardiness are perhaps redundant in the model (see Chapter 3.3.4.4.3). In contrast, the more general measure of hardiness on average explains 16.42% (adj) of the variance in composite strain explained by the models of best fit (i.e., on average 46.29% adj); or in proportional terms, hardiness on average accounts for 35.47% (adj) of the variance explained by the models. Further, when related to the results for the individual studies, the relative effect of hardiness accounts for 59.25% of the variance explained by the best fit model for study six (i.e., 41.40% adj) and a much lower 16.22% of the variance explained by the best fit model for study seven (51.18% adj). Thus, there is evidence to suggest that hardiness cognitive style (a) subsumes the more specific dimensions of hardiness, (b) is a more consistent and powerful predictor of strain, and (c) the more valid and useful indicator of cognitive style.

The relative effect of hardiness in the stressor to strain process is further evident from the dispositional effect of low and high hardiness samples on the variance in strain explained by models of best fit. As the table shows, the low hardiness samples on average explain 40.97% (adj) of the variance in strain; and the high hardiness samples on average, a much lower 19.44% (adj) of the variance in strain. That is, the high hardiness samples on average explain less than half the variance explained by the low hardiness samples; or proportional terms, high hardiness effects a reduction of 52.55% in the variance explained by the model. Furthermore, these results from the low and high hardiness samples indicate that two conceptually independent models of stress may be

used to explain the transactional nature of occupational stress. One a stress vulnerability or mediational view of stress which reflects the personal efficacy of hardy cognitive styles in the stressor to strain relationship; the other a cognitive imbalance model of stress which seemingly acts to inflate the functional importance of recognition and appraisal cognitive processes in the linkage between stressors and strain (see also discussion of results for studies six & seven).

Therefore, given the differential effect of low and high hardiness cognitive styles on the explained variance, there is evidence to suggest that individual differences in hardiness discriminate the nature of the transactional (i.e., personal) relationship with sources of work stress. For instance, in a normal distribution, dispositions for hardiness may be seen to underlie or operate in parallel with recognition and personal meaning dimensions of cognition in the stressor to strain relationship. Alternatively, as shown by the results for the low and high hardiness samples, it is feasible to separate the cognitive imbalance and vulnerability models of stress on the basis of low and high dispositions for hardiness. As the results suggest, dispositions for low and high hardiness act to moderate or bias the variance in strain explained by the combined effect of recognition and appraisal cognitive processes. Therefore, it may be the case that the magnitude of the variance explained by the models of best fit is somewhat misleading. When referenced to the mean scores for hardiness, it may in effect be substantially less than that explained by samples with normative distributions for hardiness. For example, from the descriptive data for studies six and seven (see Appendix F.1.1.1, Table F.1 & Appendix G.1.1.1, Table G.1) the mean scores for hardiness are on average nearly 20.0% higher than the expected mean values for the scales (i.e., above average hardiness). Hence, it is possible that the variance explained by the models of best fit is actually lower than the value for distributions based on normative mean values.

4.3 Measurement Dimensions of Appraisal

The view that personal meaning is disclosed in the nature of the individual's cognitive appraisal of a source of stress is a fundamental principle underlying the dynamic and reciprocal nature of the transactional approach to occupational stress (Cox, 1978). Therefore, to capture the nature of the personal meaning assigned to sources of stress requires the use of self-report measures which operationalise the hypothetical nature of the appraisal process (Lazarus, 1993). In Figure 2.1.1a (see Chapter 2.1.2 & 2.3.6), the conceptual structure of the appraisal process is outlined as including expectancy, valence, desirability and personality dimensions of appraisal. As the Figure shows, the measurement dimensions of appraisal are thought to (a) range from specific to general and (b) reflect the fusion of lower order dimensions of appraisal to form more general dimensions of appraisal. Thus, on the basis of this continuum, it was theorised that measures of valence and expectancy dimensions of appraisal would be reasonably independent in nature; and conversely, with respect to higher order constructs, that these constructs would reflect moderate relationships with both personal desirability and personality dimensions of appraisal. However, as the correlational data shows, although there was support for the conceptual independence of the expectancy and valence dimensions of appraisal, there was in effect little support for the view that lower order dimensions of appraisal converge or fuse to form higher order more general dimensions of appraisal. Indeed, contrary to expectations, the correlations tend to indicate the divergent validity of the measurement dimensions of appraisal; that is, these scales may be seen as reasonably discrete measures of the respective constructs.[2]

---

[2] For instance, from the data for study seven: valence correlates 0.32** with expectancy; 0.23** with personal desirability and -0.12 (ns) with hardiness. Similarly, expectancy was found to correlate a weak 0.13 (ns) with personal desirability; 0.23** with personal belief; 0.29** with expectancy psychological strain; and -0.09 (ns) with hardiness. In addition, personal desirability correlates a low -0.23** with hardiness; and hardiness a weak -0.20** with personal belief and a slightly higher -0.24** with expectancy for psychological strain.

The results from regression analyses indicate further support for the statistically unique effect of dimensions of appraisal in the measurement model. As Table 4.1 shows, with the exception of the valence assigned to work stressors, both specific and general dimensions of appraisal were found to explain a statistically unique and significant percentage of the variance in strain. In particular, the results from studies four, six and seven demonstrate that the cumulative effect of cognitive style and personal meaning measures of appraisal capture the nature and importance of individual differences in the appraisal of sources of stress and strain related outcomes.

Most interestingly, the data from study seven (see Table 3.3.5.20) indicate that the cumulative effect from specific and general dimensions of appraisal account for 45.95% (adj) of the variance in strain explained by the model. As the results show, when placed in the presence of significant descriptive predictors of strain, the incremental effect of significant specific (i.e., expectancy, belief and desirability) and general (i.e., commitment and control dimensions of hardiness) dimensions of appraisal explain an additional 24.71% (adj) of the variance in strain. Therefore, although the correlations indicate support for the conceptual independence of the appraisal scales, the regression analyses demonstrate the functional and complementary role of the appraisal process in the stressor to strain relationship. That is, they show that specific and general dimensions of appraisal function to shape the nature of the personal meaning assigned to common stressors. As a result, there is a need to establish the conceptual independence of specific and general dimensions of appraisal. Subsequent exploratory factor analyses indicate, at least in measurement terms, that appraisal can be presented in a more simplified model. As the results for these factor analyses show (see chapter 3.3.5.5.1), (a) the dimensions of appraisal reduce to independent factors which represent specific and general domains of appraisal; (b) the items used to measure dimensions of specific

appraisal reduce to three independent factors which replicate the structure of the respective scales. The revised model for the measurement dimensions of cognitive appraisal is shown in Figure 4.1.

The revised model indicates that domains of specific and general dimensions of cognitive appraisal may be seen to shape the nature of personal meaning; in addition, it suggests support for the conceptual independence of these measurement domains of cognitive appraisal. Furthermore, when seen in practical terms, the self-to-work emphasis of specific or personal meaning measures of appraisal have potential diagnostic value in work contexts; the more broad or global emphasis of cognitive style measures of appraisal, however, by and large do not.

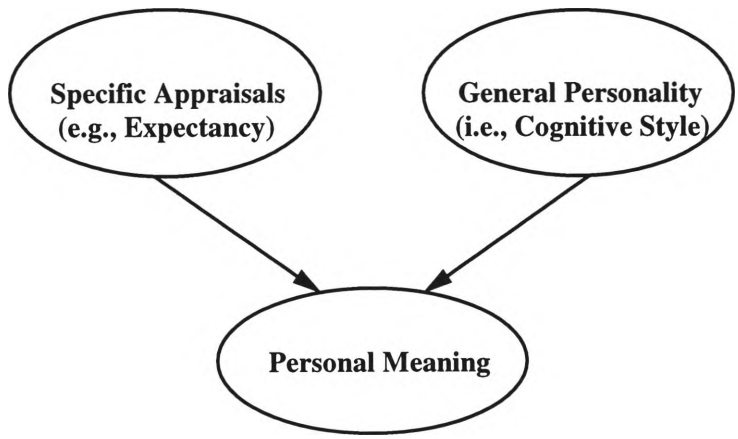


Figure 4.1 The Self-Report Measurement of Personal Meaning: Measurement Dimensions of Specific and General Appraisal

For instance, the data from study one shows that, with the exception of the positive skewness in the responses to the role-responsibility items, the response distributions for the personal valence scales are significantly skewed in the negative direction (see Appendix A.1.3). This suggests that this sample of respondents, in the main, view respon-

sibility as a good or attractive facet of their work. Personal demands associated with the other facets of work (e.g., overload and interpersonal conflict), however, are seen as decidedly bad or a most unattractive facet of their work. That is, measures of personal meaning allow an instructive insight to both (a) the nature of the individual's fit in the work context and (b) group or contextual norms for facets of work (Cooper & Payne, 1992; Smith, M., 1994).

4.4 Individualised Model of Stress

The results demonstrate that adding dimensions of meaning and cognitive style to the measurement of stress explains significantly more of the variance in strain. Therefore, in practice, they demonstrate that a large percentage of the variance in strain can be explained by a simplified model which reflects the functional role of both recognition and appraisal dimensions of cognition in the stressor to strain process (Sharit et al. 1998). As the results show, this improvement in the explained variance can be achieved by focusing on four key domains of measurement:

i) A general measure of individual differences - e.g., hardiness;

ii) Specific measures of individual differences - e.g., measures of personal meaning assigned to sources of work stress in terms of expectancy, personal beliefs and personal desirability;

iii) Those reflecting the individual's use of coping behaviours - e.g., self-care behaviours and the use of social support; and

iv) Those reflecting the individual's recognition of common work stressors in terms of either the frequency or intensity of the common demand - e.g., work overload and interpersonal relationships.

Therefore, in comparison to the descriptive emphasis of the more traditional (S-R) formulations of stress (Harris, 1995), the findings from the present research suggest that the transactional relationship between stressors and strain can be reconceptualised as an

individualised (S-O-R) model of occupational stress which may be operationalised in terms of four key domains of measurement. This comparison is shown diagramatically in Figure 4.2.

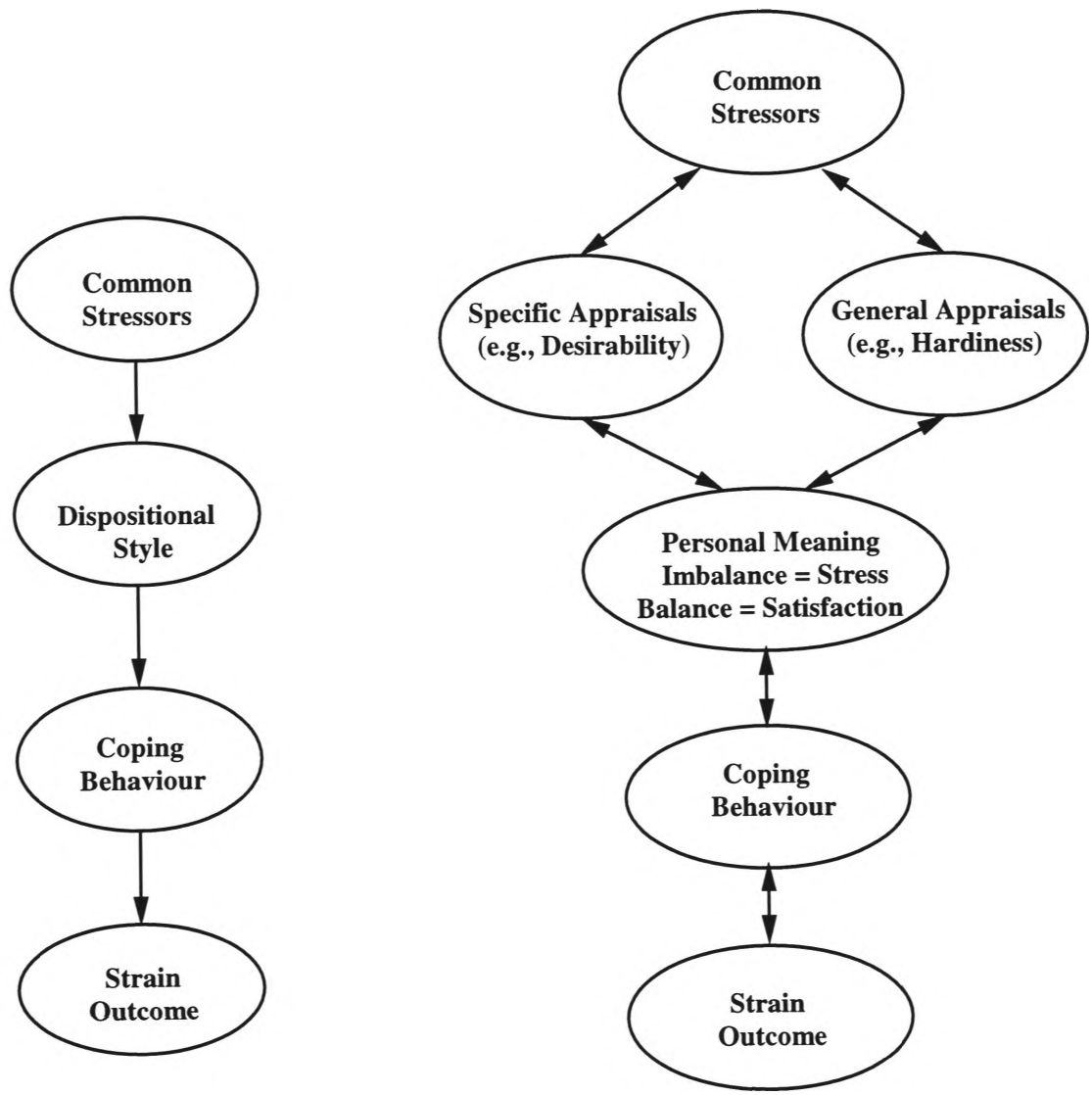


Figure 4.2 Traditional and Individualised Models of Occupational Stress

If seen in comparative terms, the traditional model of stress indicates that the nature of the stressor to strain outcome may be seen as essentially a direct function of the objective nature of common stressors. Put simply, the intensity of the stressor is presumed to exert a common effect on strain; the mediating or moderating influence of individual differences is seen as irrelevant in the model (Edwards & Cooper, 1988). For instance, high work demands are hypothesised to result in strain. By contrast, the reciprocal nature of the individualised model of stress indicates that the relationship between stressors and strain is an interdependent function of the personal meaning assigned to sources of stress. The nature of the stressor is seen as peculiar to the individual; that is, the magnitude of the response to a stressor may be seen as embedded in the individual's appraisal of the stressor (Tetrick, 1992). The personal imbalance with a stressor gives rise to stress and strain; the appraisal of balance with a source of stress, personal satisfaction and therefore reduced symptoms of strain.

In addition, the comparison indicates that the S-R model may be seen as the more straightforward approach to stress research. The present research, however, indicates that the expansion of the measurement model to include measures of appraisal enables the basis for a substantial increase in the variance explained by the model. Thus, whilst this practice extends the measurement load, the results indicate that the increase in the explained variance can be achieved within practical limits. For example, with respect to the 216 item inventory used in study seven, the inclusion of 94 appraisal items to the inventory (i.e., an increase of 77.0%) shows that (a) the items explain an additional 23.75% (adj) of the variance in strain beyond the 27.94% explained by the cumulative effect of the descriptive items; and (b) no obvious deterioration in the Cronbach alpha coefficients for the internal consistency of the scales toward the end of the inventory. However, as suggested by the 51.75% response rate for the inventory, the overall bulk

of the inventory was seemingly a deterrent for nearly 50.0% of the students who volunteered to take part in the study. In other words, the data indicates that participants are able to (a) discriminate descriptive and evaluative concepts and (b) cope with a high mental workload; in practical terms, however, there are seemingly limits to the amount of time that volunteer participants are willing to give to questionnaire completion.

4.5 Theoretical and Practical Utility of the Results

The impetus for stress research may be seen as driven by demands for theoretical and practical utility (Bailey & Bhagat, 1987; Cooper & Payne, 1992; Williams & Cooper, 1998). In essence, theoretical utility is concerned with the issues of predictive validity (Payne et al, 1988) and replication (i.e., nomothetic utility). Therefore, in more specific terms, it reflects the quest of scientific endeavour to (a) verify the relationship between conceptual and measurement models; (b) explain the variance in a dependent measure and (c) replicate and generalise the results across groups and contexts (Barratt, 1971; Bryman, 1989; Cooper & Robertson, 1995; Edwards, 1991; McGrath, 1970d).

For example, as shown by the results for the present research, the operationalisation of the appraisal process enables a substantial increase in the variance of strain explained by the measurement model. Furthermore, the significant results indicate increased support for the transactional view of stress. In addition, they demonstrate that both specific and general measurement domains of cognitive appraisal have the advantage of scientific utility. These nomothetic approaches to the measurement of appraisal allow the replication of measurement and the comparison of results both within and across studies and groups. Thus, such measurement is highly compatible with the criteria required for the conduct of rigorous empirical research (McGrath, 1970d).

The practical utility of stress research may be distinguished in terms of diagnostic, benchmark and intervention utility (Williams & Cooper, 1998). When seen in diagnostic terms, the results show that an individual difference approach to measurement (i.e., measures of appraisal in terms of expectancy, valence, belief and desirability) has the capacity to tap the personal context of the work environment. That is, they demonstrate that this approach to measurement is able to discriminate the nature and intensity of the personal meaning assigned to personal demands and the facets of work which influence the person's "quality of working life" (Payne et al., 1988, p. 149). Thus, measures of personal meaning may be seen to have both nomothetic (i.e., across contexts and populations) and contextual (i.e., applied) utility as diagnostic instruements which may be used at the individual, group and organisational levels of inquiry (Cooper & Payne, 1992). That is, they have the capacity to identify the facets of work which are either in conflict or harmony with (a) the motives of the individual, (b) social norms, values and expectations, (c) organisational objectives and standards, and (d) occupational health and safety (Cooper & Payne, 1992; Earnshaw & Cooper, 1994; Firth-Cozens & Hardy, 1992; Kompier, De Gier, Smulders & Draaisma, 1994; Levi, 1996; Rose, Jones & Fletcher, 1998; Vagg & Spielberger, 1998; Williams & Cooper, 1998). As the results show, the imbalance approach to measurement has the ability to discriminate (a) the influence of well-being on work performance, (b) negative or undesirable facets of work; (c) facets of work which relate to personal and group satisfaction and (d) contextual norms for facets of work. For example, it is possible to partial out the effect of individual differences (i.e., personal meaning) from descriptive measures of common work stressors and thereby obtain greater insight into the relationship between

facets of work and strain related outcomes. In short, the imbalance approach to measurement may be used as to (a) discriminate sources of stress and satisfaction and (b) guide the design of work.

When used for benchmarking (i.e., reference to standards), the results indicate that nomothetic measures of personal imbalance may be used as indicators of change in the nature of personal meaning or social norms from the effect of either personal (e.g., promotion) or organisational change (Callan, 1993; Dawson, 1996; Travers & Cooper, 1993). Measures of personal meaning (e.g., desirability of stressors), therefore, enable an insight to (a) the effect of changing circumstances (e.g., work practices) on the motives of the individual, (b) movements in contextual or social norms and (c) the ability of the individual to adjust to change. Therefore, in the context of benchmarking, measures of expectancy, valence, belief and desirability may provide an instructive insight to the questions: "where have I/we been"; "where have I/we got to"; "what have I/we learnt"; and where do I/we go next" (Finstad, 1998).

In contrast, intervention utility is essentially concerned with the use of stress audits to (a) identify and (b) modify the nature and source of dysfunctional personal and organisational outcomes from adverse stressor to strain relationships (Bailey & Bhagat 1987; Carlin & Farnell, 1985; Cooper & Payne, 1992; Cooper et al., 1988; Cox, 1991; Cox et al., 1990; Landsbergis & Vivona-Vaughan, 1995; Osipow & Spokane, 1983, 1987; Rose et al., 1998; Sutherland & Davidson, 1993; Vagg & Spielberger, 1998; Williams & Cooper, 1998). As such, stress audits may be used as both a screening and remedial procedure that reflects the influential role of individual experiences and differences in the stress process (Firth-Cozens & Hardy, 1992). For instance, the more general measures of cognitive style may be used as a diagnostic or screening device which discriminates the cognitive and behavioural orientation of individual's when faced with sources

of personal and environmental demand. As evident from this research, nomothetic measures of neuroticism and hardiness have a significant effect on the variance in strain; and furthermore, they allow between group comparisons both within and across studies.

However, in contrast to the whole person emphasis of dispositional measures, the more specific measures of personal meaning provide an insight to the nature of the individual's relationship with sources of stress in strain related outcomes. As the results show, measures of expectancy, belief and personal desirability were each significant predictors of strain; moreover, they demonstrate that individual differences may be seen to underpin the nature of the relationship between sources of stress and symptoms of strain. Hence, it may be concluded that measures of personal meaning have utility as a guide to (a) job design and (b) the focus of individual and group stress management programmes (Firth-Cozens & Hardy, 1992; Reynolds & Shapiro, 1991; Rose et al., 1998). Furthermore, the results indicate that nomothetic measures of personal meaning have practical value as an alternative to the use of idiographic and situational specific methodologies (Kasl, 1978; Smith et al., 1978). As the data from the battery of personal meaning scales shows, it provides (a) an insight to the individual without the necessity to use idiographic techniques and (b) sufficient detail of the individual in terms which may be used to facilitate practical intervention.

4.6 Limitations of the Research

The limitations of the research relate to three points; the sample sizes, the selection of participants and the research design. First, the effect of low sample size has a wide and destructive effect on the validity of stress research and therefore its ability to (a) test empirical hypotheses, (b) generalise the results to the wider context and (c) have practical utility. In particular, the low statistical power for studies two and three (i.e., < 0.8)

restricts the utility of these studies and increases the probability of incurring an increase in Type 2 errors. Furthermore, low sample size further reflects in the ability of a study to cross validate the results for the total sample. Significant results may in effect reflect the effect of method variance (i.e., response bias) from a particular segment of volunteer participants (Spector & Brannick, 1995). In addition, low sample size restricts the sample size and therefore the statistical power of categorical samples drawn from the total sample. For instance, the sample sizes for the low and high hardiness samples in studies six and seven (i.e., average n = 53) limits the empirical validity of the results for these samples; therefore, at best, they may be seen as exploratory in nature.

Second, the availability and access to volunteer participants is both a crucial and often troublesome phase of the data collection process (Bryman, 1989; Nachmias & Nachmias, 1981). So much so, that participants often receive some form of payment or credit for their participation in stress research. Jex and Spector (1996), for instance, in more recent times, paid employees from the University of South Florida $1.25 for the return of completed questionnaires; or is often the case for university students, credit points toward their grade for a course of study from their participation in research. The perplexing question, then, whether to use either an analogue (e.g., students) or homologous (e.g., work or clinical group) sample to satisfy the focus and objectives of the research; that is, can the sample be seen as representative or a valid substitute for the population of interest and the aims of the research (Beck, Andrasik & Arena, 1984; Nachmias & Nachmias, 1981). Furthermore, will the results have theoretical utility and external validity, that is, can they be used to (a) demonstrate support for the conceptual model, (b) generalised with confidence to the wider context and (c) will they have practical utility (Bryman, 1989; Nachmias & Nachmias, 1981; Smith, M., 1994).

Due to pragmatic reasons and the need to increase the sample size, the results for the present research reflect the data from four work samples and four samples of university students. Therefore, it could be argued that the results from the student samples are not a true reflection of the social and environmental conditions in work contexts. However, the classification of contexts in terms of work versus study is essentially an outmoded dichotomy. As the biographical data for the university samples show, the greater majority of students work either part or full time and suggests the existence of a psychological overlap or carry-over effect between work and study.

Third, the cross-sectional nature of the research design may be seen to place limitations on the validity of the results and the extent to which significant results may be used to show support for the transactional model of stress (Bohle, 1997; Cherry, 1978; Lazarus, 1995; Spector, 1994; Spector & O'Connell, 1994; Williams & Cooper, 1998). Issues such as the use of self-selecting participants, the exclusion of a control group to allow baseline comparisons, the inability to control the effect of third variables and manipulate independent variables, the simultaneous collection of data at a point in time and the inability to demonstrate causality are seen to limit the utility of cross-sectional research (Bohle, 1997; Brown et al., 1993; Bryman, 1989; Nachmias & Nachmias, 1981; Rose et al. 1998; Spector, 1994).

Thus, when related to transactional theory, cross-sectional designs only provide a slice in time or static insight to the reciprocal and dynamic nature of the transactional process underlying the stressor to strain relationship (Lazarus, 1995). Nonetheless, they do, however, enable a snapshot of the stress phenomenon and suggest directions for future research. As Spector (1994) points out, cross-sectional studies are invariably but the first step in the study of a particular phenomenon; they enable the basis for research to move on to other methodologies and test hypotheses suggested from the results of

cross-sectional studies. Uni-directional causality, however, is a redundant concept in the transactional view of occupational stress (Lazarus, 1995; Tetrick, 1992) and suggests that a longitudinal methodology is the more valid approach to investigate the reciprocal and unfolding nature of occupational stress (Bohle, 1997; Firth-Cozens, 1992; Hurrell Jr. et al., 1998; Lazarus, 1995; Williams & Cooper, 1998). As Bryman (1989) points out, where there is an assumption of reciprocal causation in the relationship between variables, a longitudinal panel design is one way to discern the significance and nature of the personal adjustment to transactional relationships over intervals of time (e.g., Bohle, 1997; Folkman & Lazarus, 1985; Spector & O'Connell, 1994). In particular, such designs provide a baseline or point of reference for comparative purposes and furthermore, may seen as analogous to a control group in the experimental domain. However, concurrent with the design of stress research, a number of conceptual and measurement issues may also be seen to underlie the validity and utility of stress research. The nature of these issues is discussed below.

4.7 Conceptual and Measurement Issues Underlying Stress Research

Reasons for the inability of stress research to explain greater than a moderate percentage of the variance in strain are complex (Kasl, 1978, 1984, 1987, 1996, 1998) and essentially beyond the scope of this discussion. For instance, from the data for the present research, on average the studies explain only a moderate 38.5% of the variance in strain; 61.5% of the variance in strain remains to be explained. This discrepancy, however, is heuristic in its own right. It suggests that deficiencies in either the design of the studies, the methodology and/or the measurement model account for the unexplained variance (Spector, 1994; Kasl, 1998). For instance, improvements to (a) the reliability (and validity) of measurement, (b) the independence of the variables in the measure-

ment model and/or (c) the number of constructs in the measurement model (Spencer & Brown, 1986; Williams & Cooper, 1998) may enable the model to account for more of the unexplained variance in strain.

There are, however, a number of particular issues which may be seen to influence the predictive validity, theoretical utility and practical utility of stress research. In part, as outlined above, it may be seen as a function of (a) the reliability, validity and conceptual independence of the variables in the measurement model; (b) the content of the measurement model, or (c) the slippage between theoretical models and methodological practice (Bryman, 1989; Smith, M., 1994). For instance, as shown by the results from the present research, the exclusion of personal meaning dimensions of appraisal from the measurement model restricts the validity and utility of stress research. In addition, the often marginal reliability of the personal meaning scales indicates that the correlations with strain may in effect be somewhat deflated due to the effect of random errors in measurement (Spector & Brannick, 1995).

Furthermore, it may also be seen as a function of the stress concept. Formulations of stress are variously described and as a result there is little consensus on (a) the definition of stress (Hobfoll, 1988; Kasl, 1996; Lazarus, 1966; Vagg & Spielberger, 1998); (b) the focus of stress research and methods of measurement used in stress research (Cohen et al., 1995, Kasl, 1987; McGrath, 1970c); and (c) the functional role of stress (i.e., psychological, physiological & social) in health related outcomes (Cohen et al., 1995; Hurrell Jr. et al., 1998; Kasl, 1996, 1998; Pratt & Barling, 1988). In particular, variations in the focus of stimulus, response and appraisal centred formulations of stress are typically used to explain the nature and effects of occupational stress. That is, the respective formulations are essentially concerned with either (a) the properties and direct effect of work demands on symptoms of strain, or (b) the biological, psychological, behavioural

or social response to work related demands or alternatively, or (c) the intervening (i.e., mediating) role of individual differences in the relationship between stressors and strain. This diversity, therefore, may be seen to effectively limit the ability of stress research to adequately account for the variance in measures of strain. Furthermore, it has generated a body of scientific knowledge on the topic of occupational stress which is difficult to integrate both conceptually and empirically into stress research. In all, then, it is difficult if not impossible to draw conclusions on the relative efficacy of stress research to explain the variance in strain related outcomes. However, as shown by the present research, an individualised approach to occupational stress enables a more holistic and improved understanding of the stressor to strain process.

Finally, it is important to consider the issue of errors in measurement or common method variance: in essence, that the results are not an artefact of the research design and/or methodology (Karasek et al., 1998; Kasl, 1998; Schmitt, 1994). As Spector (1994) argues, sources of method variance (i.e., the surreptitious effect of third variables) may result from both methodological and individual (i.e., personality dispositions, mood states and cognitive sets) sources of contamination. For instance, the unintended effect of the questionnaire design; anxiety and fatigue states; attitudes and beliefs; or personality dispositions such as neuroticism may all influence the variance in a measured variable. Method variance, therefore, is a systematic and common source of error which may either inflate or deflate the correlations between self-report scales (Spector & Brannick, 1995).

With regard to methodological bias, the research is essentially limited by the exclusive use of self-report surveys to assess both independent and dependent variables. However, with respect to the measurement of stressors and strain, care has been taken to avoid the carry-over effect from semantic overlaps between independent and depend-

ent variables (Hurrell Jr. et al., 1998; Kasl, 1998; Lazarus et al., 1985). Furthermore, both within and between dependent variables, care was also taken to assess (i) the content and relevance of the items in each strain scale and (ii) the conceptual independence of the strain scales. It should be noted, however, that test validation of the self-report strain scales against objective measures of strain such as heartrate, muscular fatigue, avoidance behaviours, heart disease and neurohormonal responses is both conceptually and methodologically challenging for stress research (Brown et al., 1993; Cox, 1985a; Daleva, 1987; Hurrell Jr. et al., 1998; Kasl, 1998; Melin et al., 1999; Siegrist & Peter, 1994). It is a challenge beyond the scope of this thesis.

With respect to individual sources of response bias, however, the issue in this case is not that individual differences in higher order personality factors do not act to influence the variance in lower order cognitive processes. This issue, when seen conceptual terms, is essentially more one that is explicitly concerned with the explanatory and practical utility of stress research; in this case, the trade-off in the ability of nomothetic (i.e., general) and idiographic (i.e., self-referrent) measurement to provide a substantive insight to the nature of the stressor to strain process (see Chapter 2.1.2). For example, when compared in nomothetic terms, neuroticism and hardiness may be seen as more general personality constructs than the self-referrent nature of the more specific expectancy, valence and desirability dimensions of appraisal (see Figure 2.1.1a); and in variance terms, there is little doubt that the relative effect of dispositions for neuroticism and hardiness explain substantially more of the variance in strain than nomothetic measures of expectancies, beliefs and desirability. In addition, the studies clearly demonstrate (i) the moderating and mediating effect of neuroticism and hardiness in the respective models and (ii) that personality factors limit the power of lower order con-

structs in a regression model. Hence, when the statistical models are considered in conceptual terms, it reasonable to conclude that the significant results are not unduly influenced by some underlying source of individual bias (Spector & Brannick, 1995).

The more critical issue for stress research, however, is that higher order personality concepts (e.g., hardiness and neuroticism) are far from exact constructs (i.e., what they actually mean is debatable) and may be seen to reflect a fusion of lower order constructs (see Chapter 2.1.2; and Figures 2.1.1 & 2.1.1a) . Therefore, beyond their utility as more general indicators of the variability in cognitive styles, their conceptual, explanatory and practical utility in the measurement and understanding of occupational stress is by and large limited. In contrast, the meaning and focus of more specific constructs such as expectancy and valence are more exact in nature and because of this, they are of greater explanatory (but not statistical) value in conceptual and measurement models of occupational stress. As the results show, significant lower order dimensions of appraisal may be seen to have conceptual, explanatory and practical utility in stress research.

At the other extreme of measurement, however, idiographic measurement techniques may be seen to have contextual utility, but very little conceptual and explanatory utility. Nevertheless, by drawing on its inherent qualities and usefulness as a measure of contextual meaning, the present research has shown that replacing idiographic measurement with nomothetic measures of personal meaning (i.e., in terms of expectancy, belief and desirability) it is possible to bridge some of the gap between these dichotomous approaches to measurement (Morey & Luthans, 1984). In other words, the results demonstrate that (a) by its very definition, the exclusion of personal meaning (i.e., individual differences) dimensions of appraisal from models of occupational stress is itself a

source of common method variance; and (b) nomothetic measures of personal meaning may be seen as a viable and constructive alternative to the use of idiographic measurement in stress research.

The quandary that underlies the trade-off between the use of nomothetic and idiographic measurement in stress research is, however, not without some support. As Smith et al. (1978) concluded from a study that investigated the use of repertory grids in vocational guidance: from the use of repertory grids . . .

> it would be possible to establish how various occupational groups construe their work environment. It might then be possible to develop norms, and use the repertory grid as a traditional nomothetic instruement. But unfortunately this might jettison the repertory grids' unique idiographic advantages (p. 104).

Each of these approaches to measurement has, by its very nature, its own unique utility in the realm of stress research (see Chapter 2.1.2). When seen in terms of conceptual, explanatory and practical utility, however, it is only from advances in the development of nomothetic measurement that the principles of scientific endeavour are able to improve the understanding of the transactional nature of occupational stress.

5.8 Directions for Future Research

There are three key areas for future research. Each in their own right serving to (a) further explore the role of personal meaning dimensions of appraisal in the stressor to strain process and (b) advance the understanding of occupational stress.

First, it would be useful to replicate the results of study seven in a wider range of settings. However, as the response rate for the study shows, there is seemingly a reluctance to answer lengthy stress inventories and suggests the need to reduce the bulk of the inventory. In particular, measures of stressor expectancy and stressor valence were either irregular or non-significant predictors of strain throughout the research and indicates that these scales should be removed from the measurement model.

Second, it would be useful to further explore the role of specific and general dimensions of individual differences in the transaction model. For instance the appraisal of sources of stress in terms of their importance to the individual suggests that measures of personal values (Locke, 1969, 1976, 1984; Schabracq & Cooper, 1998; Smith, M., 1994) may contribute useful information to the explained variance in strain. Granted this focus may be seen as somewhat similar to the personal desirability of stressors, but the use of a scale which further taps the value-discrepancy model of stress or the motivational component of the stress process (Lazarus, 1995; Lazarus et al, 1952) is a logical route to follow. For instance, a tripolar differential scale with the response format "Important to me" "About right for me" "Not important to me" would offer a further insight to the appraisal of an imbalance between sources of stress and the individual's hierarchy of values. Furthermore, contrary to expectation, measures of the valence of stressors were not significant predictors of strain and suggests among other things, that this result may in effect be an artefact of the methodology. The response options for the scale were restricted to a good/bad format and hence that this may be a somewhat rigid or inflexible approach to the measurement of personal valence. As Ajzen & Fishbein (1980) point out, in addition to the evaluative anchors good/bad, attitudes may also be measured using evaluative formats such as harmful/beneficial, foolish/wise, pleasant/unpleasant and favourable/unfavourable. Therefore, it may be the case that a good/bad format is not necessarily the normal or logical frame of reference for the personal response to items in the valence scale.

In addition, it may also be the case that other dimensions of cognitive style (Payne, 1988a, 1991; Schaubroeck & Ganster, 1991) and factors of intelligence or cognitive ability (Robertson & Smith, 1989; Sharit et al., 1998; Schabracq & Cooper, 1998;

Smith, M., 1994) play a significant if not more important role in the nature of stressor to strain outcomes. For example, there is wide acceptance that a "big five" framework best represents the structural nature of human personality (Cooper & Robertson, 1995). Therefore, it would seem logical to integrate these dimensions of cognitive style into the measurement and explanation of the stressor to strain process.

Third, the results indicate that an individualised model of stress has the potential for practical utility in applied settings. Therefore, it would be useful to further develop the scales in the model and standardise the inventory for use in applied settings.

4.9 General Conclusions From the Research

Overall the results demonstrate the advantage and utility of including dimensions of appraisal in the measurement and explanation of occupational stress. The following general conclusions may be drawn from the results of the research programme:

(1) The inclusion of specific (i.e., personal meaning) and general (i.e., cognitive style) dimensions of appraisal in the measurement of occupational stress enables a significant and substantial increase in the variance of strain explained by measurement models. In particular, the appraisal of sources of stress in terms of expectancy, belief and desirability explain a significant and additional percentage of variance in strain beyond that explained by the recognition of common stressors.

(2) It is indeed both possible and useful to operationalise the evaluative nature of cognitive appraisal by shifting the focus of measurement to the gestalt of the appraisal process. Furthermore, it shows that there are in effect several ways to conceptualise and measure the nature of the personal meaning signed to sources of work stress. With the exception of the personal valence (i.e., attractiveness) of common stressors, each has a significant effect and functional role in the nature of the stressor to strain relationship.

(3) In proportional terms, dimensions of personal meaning and cognitive style on average account for approximately 40.0% of the variance in strain explained by measurement models. That is, it indicates that individual differences underlying the use of specific and general dimensions of appraisal shape the nature of the personal meaning assigned to sources of intrinsic and extrinsic stress and strain outcomes.

(4) An evaluative or imbalance approach to the measurement of the personal desirability assigned to common stressors demonstrates that (a) it is possible to conceptualised occupational stress as a "value conflict" discrepancy between the appraisal of actual and ideal demands; (b) measures of personal imbalance (balance) reflect the influence of individual differences in the appraisal of work demands; and (c) imbalance measurement has practical utility as a nomothetic diagnostic of work contexts.

(5) An individualised model of occupational stress which incorporates (a) common stressors, (b) coping strategies, (c) personal meaning dimensions of appraisal and (d) personality cognitive styles provides the basis for an improved understanding of the stressor to strain relationship.

(6) The personal meaning of work stressors can be measured using a nomothetic approach to measurement. As the results show, this approach to measurement is a viable and practical alternative to the use of context specific and idiographic techniques for the measurement of contextual meaning. Furthermore, it enables the basis for science to advance the understanding of the transactional process underlying occupational stress.

Therefore, given the significant results from the research programme and the above conclusions, there is clear support for both the aim and principal hypothesis of the thesis. It demonstrates that a personal meaning approach to the measurement of occupational stress enables a significant improvement in the understanding of the transactional process underlying occupational stress.

University of Wollongong

PhD Thesis

Taking A Transactional View of Occupational Stress Into Self-Report Measurement

Volume Two

Appendices
≈
References

Harlan Thomas Abson
Department of Psychology
1999

TABLE OF CONTENTS

Volume 2

Appendices: Study 1 - Study 7

≈

References

Appendices: List of Tables

Table **Page**

Study One

Study Two

Study Three

Study Four

Study Five

Study Six

Study Seven

Appendices: List of Figures

Appendices: List of Questionnaire Surveys

Appendix A

Study 1

Table A.1
Biographical Summary of Sample

Profile	Biographical Category	n	Percentage
Sex	Male	151	97.42
	Female	4	2.58
Living Status	Married/Defacto	103	66.45
	Single	52	33.55
Age	19-20	14	9.03
	21-25	21	13.55
	26-30	27	17.42
	31-35	30	19.35
	36-40	15	9.68
	41-45	23	14.84
	46-50	15	9.68
	51-60	10	6.45
Job Classification	Manager/Controller	4	2.58
	Foreman/Technical Instructor	27	17.42
	Production Planner	3	1.94
	LAME Avionic	36	23.23
	LAME Mechanical	9	5.81
	Ground Engineer - Avionic	56	36.13
	Ground Engineer - Mechanical	3	1.94
	Ground Engineer - Unspecified	14	9.03
	Other	3	1.94
Job Role (Generally)	Supervisor/Technical Instructor	44	28.39
	Acting Supervisor	22	14.19
	LAME Non-Supervisory	11	7.10
	Ground Engineer - Non Supervisory	67	43.23
	Technical Staff - Non Supervisory	6	3.87
	Other (Trades , Non-Trades)	5	3.23
Shift Pattern	Day, Afternoon and Night	58	37.42
	Day and Afternoon - 7 day shift	45	29.03
	Day and Afternoon - Monday/Friday	4	2.58
	Day Worker - 7 day Shift	33	21.29
	Day Worker - Monday/Friday	15	9.68
Months Service With Company	1-12	11	7.10
	13-24	18	11.61
	25-60	29	18.71
	61-120	20	12.90
	121-180	16	10.32
	181-240	20	12.90
	241-300	13	8.38
	301-360	20	12.90
	361-476	8	5.16
Months In Current Position	1-12	39	25.16
	13-24	37	23.87
	25-60	49	31.62
	61-120	15	9.68
	121-180	8	5.16
	181-240	3	1.94
	241-300	1	0.64
	301-360	1	0.64
	361-415	2	1.29
Months In Current Trade/ Professional Area	1-12	4	2.58
	13-24	13	8.39
	25-60	19	12.26
	61-120	22	14.19
	121-180	27	17.42
	181-240	21	13.55
	241-300	11	7.10
	301-360	25	16.13
	361-513	13	8.39
Job Location	Main Base/SIT	154	99.35
	Outstation	1	0.65

Note: n = 155; LAME - Licensed Aircraft Maintenance Engineer

A.1 Results

A.1.1 Qualitative Results

A large number of participants reported some difficulty with the bulk of the inventory and the nature of the items in the dispositional and affective scales. The majority of participants required at least an hour to complete the test battery. As such, the effect of time, mental fatigue and perhaps boredom with the task had the potential to influence the results. Furthermore, a large number of participants reported that items in the Type A Behaviour and Locus of Control scales were in the main difficult to comprehend. In addition, many participants reported that the expectancy and valence items were somewhat confusing to answer due to the repetitive or commensurate nature of the affective items. In other words, it would seem they were confused about the similarity of the two personal meaning scales and perhaps found it difficult to make the conceptual distinction between them. For example, following the return of the completed questionnaires, approximately a third of the participants questioned the reason for using similar items in the expectancy and valence scales.

In summary, it would appear that participants were (a) potentially confused by the similarity between the personal meaning scales, and (b) disturbed by the time they required to complete the research survey (see Appendix A.2, Work Stress Survey).

A.1.2 Descriptive Statistics

Descriptive statistics (n = 148) for the scale means, standard deviations (SDs), scale response range, skewness and internal consistency (i.e., Cronbach alpha coefficients) based on the collected data (n = 155) are shown in Table A.2. A graphical comparison of the scale means with the published data indicates that with the exception of those for the Role-Responsibility, Physical Environment, Physical Strain, Composite Strain

and Locus of Control scales, the mean scores are essentially similar (see Figure A.1). A statistical comparison (i.e., Z test) of the deviant mean scores at alpha 0.001 (two-tail) confirmed the sample mean scores as significantly different from the published data (Mendenhall & Ott, 1980). That is, the mean scores for the Physical Environment and Locus of Control scales are significantly higher than the published data; those for the Role-Responsibility, Physical Strain and Composite Strain scales, significantly lower than the published data. Furthermore, the mean scores for the OSI coping and OSI strain scales are all on average, 3.60 lower than those of the published data.

With the exception of the Expectancy Role-Responsibility scale, the mean scores for the work stressor expectancy and short form OSI stressor scales are generally less than those obtained for the work stressor valence scales. For example, those for the expectancy and Composite Expectancy scales are noticeably lower than the mean score for the Composite Valence scale. Conversely, the mean score for the Valence Role-Responsibility scale is substantially lower than the mean scores for both the work stressor valence and work stressor expectancy scales. That is, the data indicates that the participants have predominantly used the positive pole of the scale (i.e., response pole "good") in their response to the items in the Valence Role-Responsibility scale.

The SDs for the sample data are generally smaller than the SDs of the published data. In particular, the SDs for the OSI descriptive scales Role-Ambiguity, Role-Boundary and Role-Insufficiency are noticeably less than the published data. Similarly, the SDs for the Psychological, Physical and Composite Strain scales are somewhat smaller than the published data. Furthermore, the variability of the scores for the Composite Valence scale (i.e., range = 38) is substantially less than the variability of the scores for both the Composite Expectancy (i.e., range = 46) and Composite OSI Stressor (Short Form)

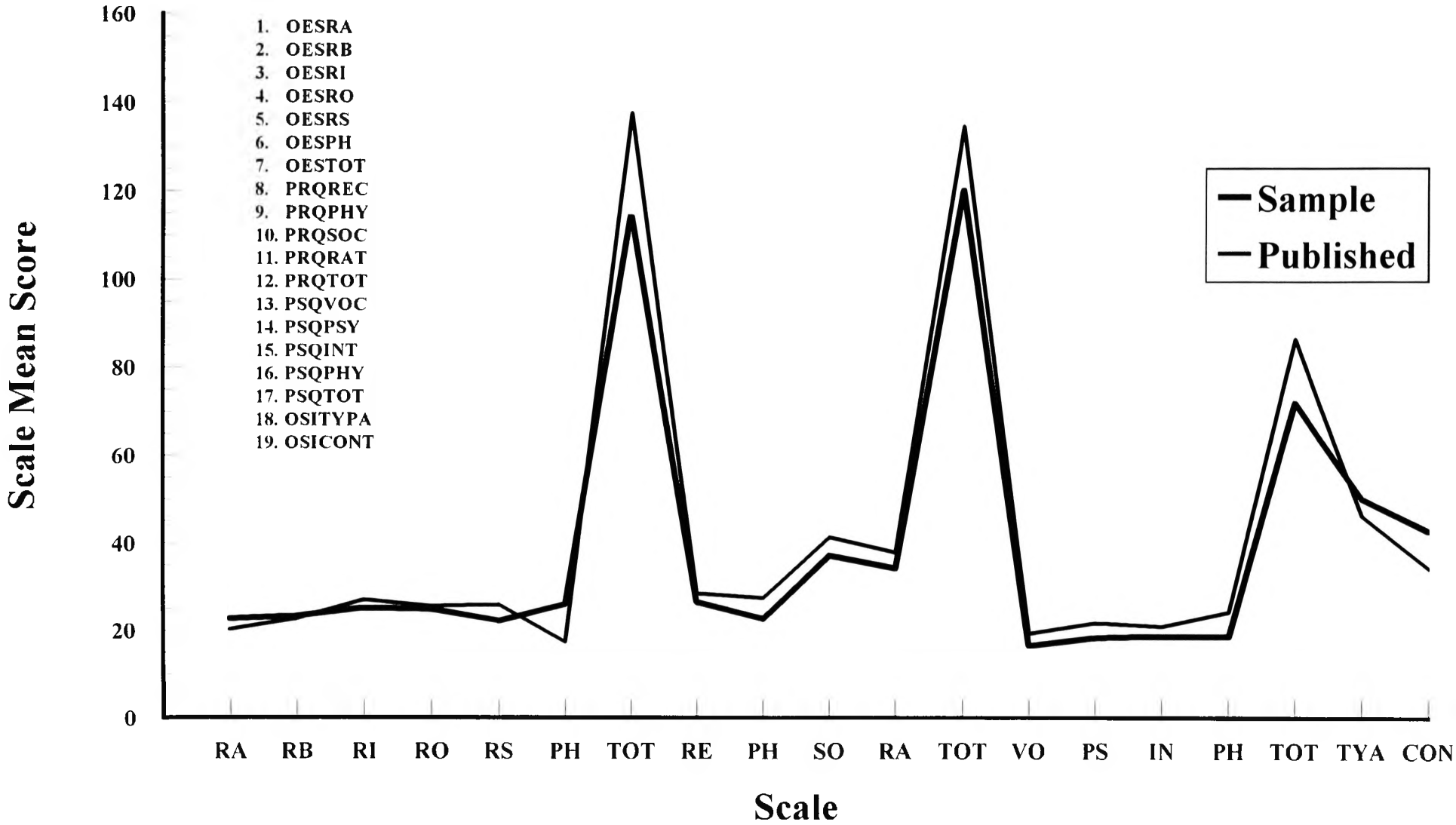


Figure A.1 Comparison of Sample Mean Scores With Published Mean Scores

scales (i.e., range = 46). Similarly, the range of the observed responses for the Role-Insufficiency, Role-Ambiguity and Role-Boundary valence scales and those for the Type A Behaviour and Locus of Control scales reflect a constricted range of responses. As Tabachnick and Fidell (1983) point out, deflated correlation's often result from a restricted range of responses, since low correlations are often a reflection of narrow SDs or constrictions in the variability of the raw data.

The indices for scale skewness are all within acceptable limits for the sample size (Tetrick & LaRocco, 1987). As such, they indicate that the raw data is essentially normally distributed (Tabachnick & Fidell, 1983). However, a comparison of the SD's and skewness values for the OSI descriptive, valence, expectancy and short form OSI stressor scales shows noticeable differences between the scales in these stressor dimensions. In particular, the SD's for the valence scales are in the main more narrow than those obtained for both the expectancy and short form OSI stressor scales. Furthermore, the negative skew values for the valence scales are generally higher than those for the expectancy, short form OSI stressor and the OSI common stressor scales. The noticeable exceptions are the substantially lower mean score, higher SD and high positive skew coefficient for the Valence Role-Responsibility scale of 5.93, 2.63 and 0.80 respectively. In short, the higher SD indicates that the participants have in effect used the range of the scale (i.e., 2 - 13) to evaluate the items in this scale. As a result, the SD for this scale approximates the expected value for the range of the responses.[A1]

The Cronbach alpha coefficients for the OSI common stressor, coping and strain scales are essentially comparable with the published data. For example, the Physical Environment scale achieved an alpha coefficient of 0.90, the Social Support coping

---

[A1] For a relatively normal distribution, the approximate SD for a scale is derived by dividing the observed range of responses by a factor of four (Mendenhall & Ott, 1980).

scale an alpha coefficient of 0.83 and the Psychological Strain scale, an alpha coefficient of 0.88. Normative reliability data for the dispositional measures Type A behaviour and locus of control is not provided in the OSI manual or OSI data supplement. However, with respect to the present study, the alpha coefficients for Type A behaviour (0.4) and locus of control (0.6) indicate low and moderate internal consistency respectively. Specifically, the alpha coefficients indicate that errors in measurement account for 60% of the variance in the Type A Behaviour scale and 40% of the variance in the Locus of Control scale (Spector, 1994).

The alpha coefficients for the valence, expectancy and short form OSI common stressor scales are generally lower than those for the descriptive OSI stressor scales. For instance, the maximum alpha coefficients for the valence and expectancy scales are 0.70 (Valence Role-Responsibility) and 0.85 (Expectancy Role-Responsibility) respectively. Furthermore, with the exception of the Role-Responsibility and Physical Environment scales, the valence scales exhibit both poor and irregular reliabilities; alpha coefficients for the deviant scales ranging between 0.17 and 0.38. Moreover, the mean alpha coefficient of 0.47 for the valence scales (see Table 3.2.1.2) is substantially lower than the mean values for the expectancy (0.74), short form OSI stressor (0.72) and descriptive OSI stressor (0.77) scales. That is, the alpha coefficient implies that errors in measurement (i.e., random and non-random) account for 53.0% of the variance in the response to the valence scales. Moreover, the highest alpha coefficients for the respective valence and expectancy scales indicate that the maximum possible validity of the self-report scales measuring valence and expectancy are 0.84 and 0.92 respectively.

Table A.2
Descriptive Statistics: OSI Stressor, Valence, Expectancy, Short Form Stressor, Coping, Dispositional and Strain Scales

Scale	Mean	SD	Scale Range	Observed Range	Skew	Cronbach Alpha (+)
Stressor (OSI)						
Role-Overload	24.80	6.59	---	12 - 43	0.50	.81
Role-Insufficiency	25.17	6.62	---	10 - 41	0.18	.80
Role-Ambiguity	22.65	4.58	10 - 50	10 - 34	-0.05	.63
Role-Boundary	23.34	5.34	---	11 - 34	-0.27	.67
Role-Responsibility	22.14	5.98	---	12 - 37	0.25	.72
Physical Environment	25.95	9.14	---	10 - 50	0.63	.90
Composite OSI##	144.00	21.40	60 - 300	90 - 197	0.04	.88
Valence						
Role-Overload	10.41	2.46	---	2 - 14	-0.63	.38
Role-Insufficiency	12.18	1.46	---	7 - 14	-0.78	.40
Role-Ambiguity	12.41	1.54	2 - 14	8 - 14	-1.08	.17
Role-Boundary	12.07	1.62	---	7 - 14	-0.90	.38
Role-Responsibility	5.93	2.63	---	2 - 13	0.80	.70
Physical Environment	10.79	2.49	---	3 - 14	-0.77	.67
Composite Valence##	63.80	6.40	12 - 84	43 - 81	-0.24	.57
Expectancy						
Role-Overload	10.05	2.42	---	4 - 14	-0.75	.75
Role-Insufficiency	9.20	2.17	---	3 - 14	-0.29	.51
Role-Ambiguity	9.33	2.51	2 - 14	3 - 14	-0.28	.76
Role-Boundary	8.89	2.60	---	2 - 14	-0.52	.72
Role-Responsibility	8.57	2.52	---	2 - 14	-0.28	.85
Physical Environment	9.81	2.44	---	2 - 14	-0.65	.76
Composite Expectancy##	55.85	9.35	12 - 84	31 - 77	-0.17	.81
Stressor OSI (Short)						
Role-Overload	7.35	2.79	---	2 - 12	-0.30	.72
Role-Insufficiency	6.30	2.92	---	2 - 14	0.24	.69
Role-Ambiguity	7.13	2.70	---	2 - 13	-0.26	.57
Role-Boundary	7.43	2.71	2 - 14	2 - 14	-0.22	.71
Role-Responsibility	9.11	3.63	---	2 - 14	-0.49	.89
Physical Environment	10.88	2.30	---	2 - 14	-0.96	.69
Composite OSI (SF)##	48.20	10.22	12 - 84	23 - 69	-0.28	.74
Coping						
Recreational	26.43	5.66	---	15 - 43	0.29	.72
Self-Care (Physical)	22.55	5.56	10 - 50	10 - 39	0.33	.65
Social Supports	37.03	7.83	---	14 - 50	-0.63	.83
Rational-Cognitive	34.10	5.80	---	20 - 50	-0.01	.76
Dispositional						
Type A Behaviour##	49.81	5.40	14 - 84	38 - 65	0.38	.60
Locus of Control##	42.34	4.38	12 - 72	31 - 55	-0.05	.40
Strain						
Vocational	16.41	3.82	--	10 - 31	0.76	.73
Psychological	18.22	6.07	10 - 50	10 - 37	0.80	.88
Interpersonal	18.61	4.44	---	9 - 31	0.37	.70
Physical	18.47	6.41	---	10 - 38	0.88	.88
Composite Strain##	71.70	16.59	40 - 200	44 - 117	0.60	.93

Note: n = 148; (+) Cronbach Alpha: n = 146 - 155, Interpersonal Strain - n = 101, Composite Strain - n = 98; ##Composite Scale - Derived From Sum of Items in Sub-Scales.

A.1.3 Summary of Variability Statistics

A summary of the variability data for the valence, expectancy and descriptive OSI common stressor scales is shown in Table A.3. The mean SD for the valence scales (2.66) is 0.77 lower than the mean SD for the expectancy Scales (3.43). Furthermore, the mean negative skew value for the valence scales (-0.51) is -0.09 is more negative than that for the expectancy scales (-0.42) and -0.69 more negative than the positive value for the descriptive scale (0.18). That is, with the exception of the Role-Responsibility scale, the variability data indicates that the participants responses to the items in the valence scales in the main converge toward the negative pole (i.e., response "bad") of the response scale. Consequently, the variability of the scale items is reduced. This may provide a partial explanation for the low alpha coefficients for internal consistency achieved by the valence scales. Specifically, the low alpha coefficients may in effect reflect the effect of method variance contamination rather than the effect of random errors in measurement (Spector & Brannick, 1995). That is, the non-random effect of method variance may emerge in the form of reduced inter-item correlations due to the narrow variability or homogeneity in the responses to the valence items (Norusis, 1988b). However, it is also important to note that the observed range of responses to the Role-Overload (i.e., 2 - 14) and Physical Environment (i.e., 3 - 14) valence scales also reflect a more normal or broader range of responses to the items in the respective scales. That is, when viewed collectively, the response data implies that the stimulus properties or the response format used in the valence scales may be seen as in effect psychometrically sound. Therefore, it would appear that some form of intrinsic response bias common to this sample has acted to influence the participants response to the semantic nature of the valence items and the emotional emphasis of the bipolar response scale used for the valence scales (Clarke, 1998; Schabracq & Cooper, 1998;

Smith, M., 1994; Williams & Clarke, 1997). As the data indicates, the Valence Role-Responsibility scale is the only valence scale with a positive skew (i.e., 0.80) and would seem to indicate that the role of responsibility is seen as a positive facet of work by this sample. Whereas, for the remaining valence scales, the high negative skew values suggest that these facets of work are seen as bad or essentially negative by this sample.

Table A.3
Variability Statistics: Valence, Expectancy and OSI Stressor Scales

Stressor Dimension	Valence Scales			Expectancy Scales			OSI Stressor Scales		
	SD	Skew	Alpha	SD	Skew	Alpha	SD	Skew	Alpha
Overload	2.46	-0.63	.38	2.42	-0.75	.75	6.59	0.50	.81
Insufficiency	1.46	-0.78	.40	2.17	-0.29	.51	6.62	0.18	.80
Ambiguity	1.54	-1.08	.17	2.51	-0.28	.76	4.58	-0.05	.63
Boundary	1.62	-0.90	.38	2.60	-0.52	.72	5.34	-0.27	.67
Responsibility	2.63	0.80	.70	2.52	-0.28	.85	5.98	0.25	.72
Physic Envir	2.49	-0.77	.67	2.44	-0.65	.76	9.14	0.63	.90
Composite	6.40	-0.24	.57	9.35	-0.17	.81	21.40	0.04	.88
Mean Value	2.66	-0.51	.47	3.43	-0.42	.74	8.52	0.18	.77

A graphical presentation of the response frequencies for the variables in the valence and expectancy scales is shown in Figures A.2 to A.13. As shown in the graphs for the individual valence variables, with exception of variables 9 and 10 (i.e., Role-Responsibility scale), the response frequencies for the valence scales are primarily negatively skewed. Furthermore, the response frequencies for the variables tend to cumulate within the response scores 5 - 7. As a result, the SD's for the individual valence scales are more narrow and the negative skew values in general, substantially higher than those for the commensurate expectancy variables. By contrast, the graphs for the expectancy scales show that the responses to these scales are essentially more normally

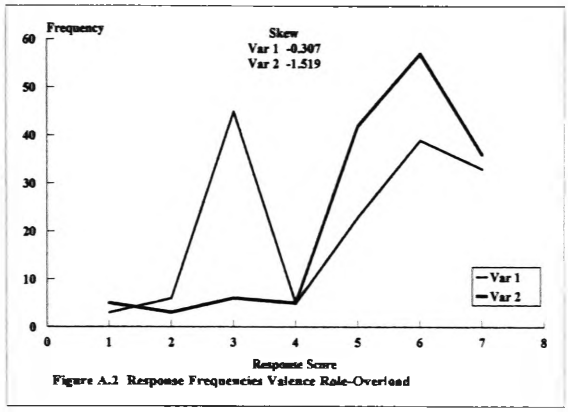


Figure A.2 Response Frequencies Valence Role-Overload

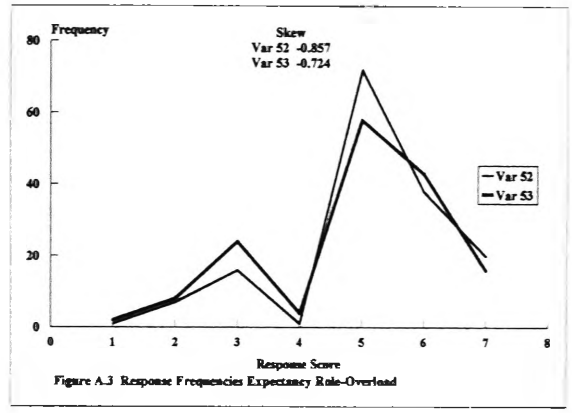


Figure A.3 Response Frequencies Expectancy Role-Overload

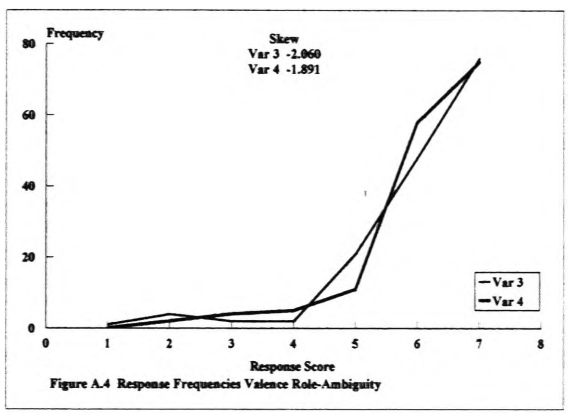


Figure A.4 Response Frequencies Valence Role-Ambiguity

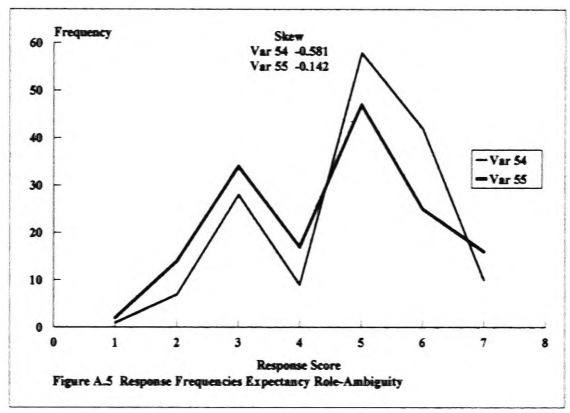


Figure A.5 Response Frequencies Expectancy Role-Ambiguity

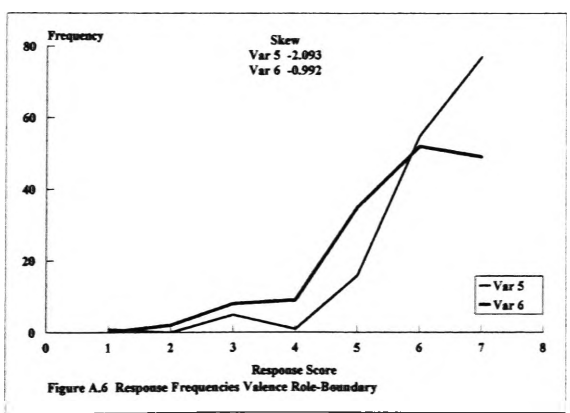


Figure A.6 Response Frequencies Valence Role-Boundary

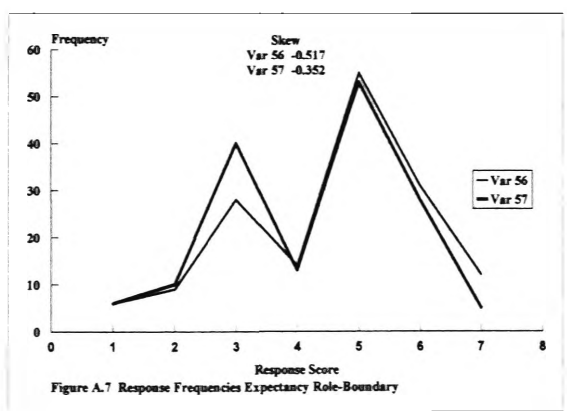


Figure A.7 Response Frequencies Expectancy Role-Boundary

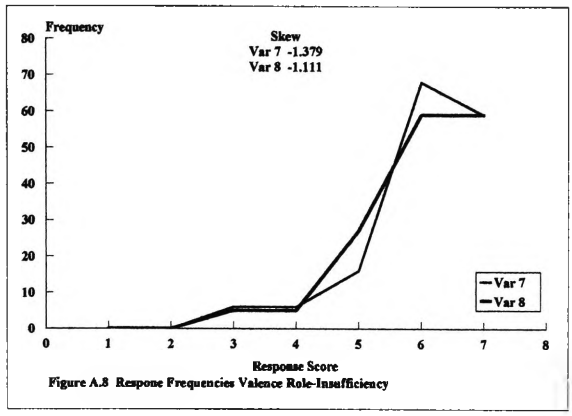


Figure A.8 Response Frequencies Valence Role-Insufficiency

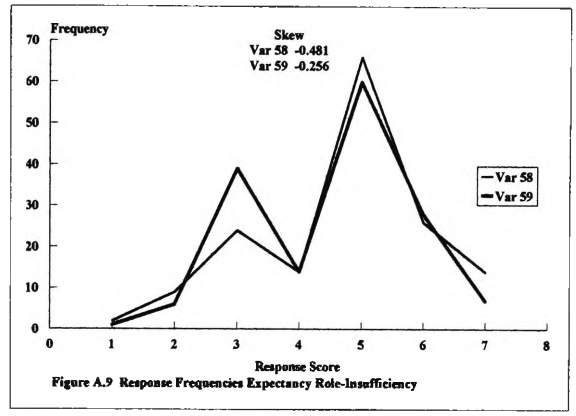


Figure A.9 Response Frequencies Expectancy Role-Insufficiency

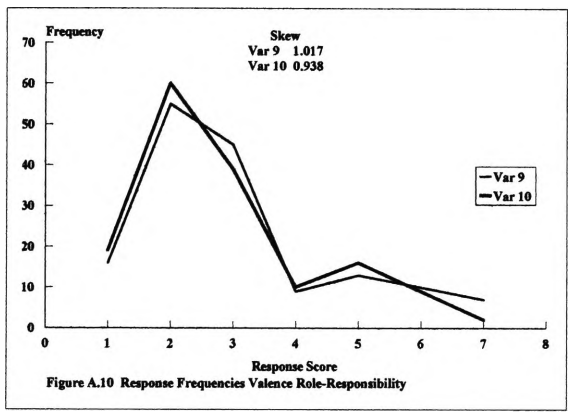


Figure A.10 Response Frequencies Valence Role-Responsibility

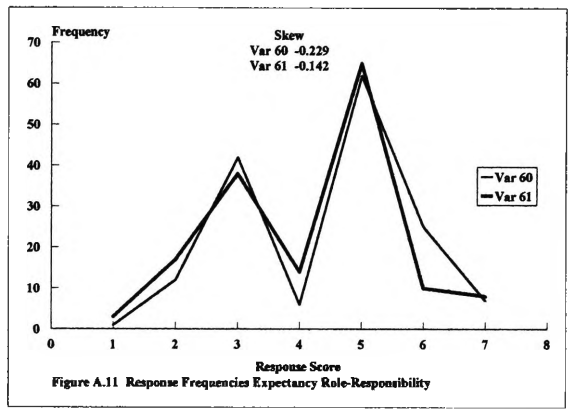


Figure A.11 Response Frequencies Expectancy Role-Responsibility

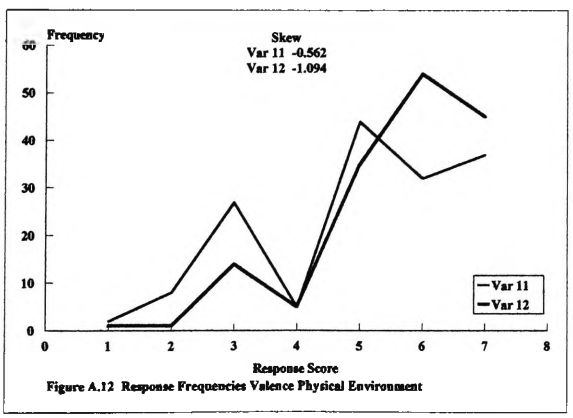


Figure A.12 Response Frequencies Valence Physical Environment

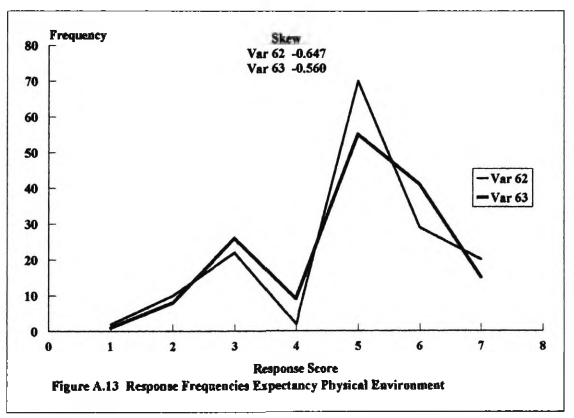


Figure A.13 Response Frequencies Expectancy Physical Environment

distributed. However, as indicated, the cumulative response frequencies for each of the expectancy scales is clearly bimodal. One smaller grouping of cumulative frequencies tending to fall within the response scores 1 to 4 (i.e., will not likely cause me stress); the other, a much higher grouping of cumulative frequencies within the response scores 4 to 7 (i.e., will likely cause me stress).

The significance of the bimodal distribution is perhaps more instructive when the format of the response scale is taken into account. The range of the bipolar response scale included the neutral response "0" in the range of positive and negative responses choices and thereby gave the participants the opportunity to record an indecisive response or regress toward the neutral position (Dawis, 1987). However, contrary to expectation, the reversion to the neutral position is in effect minimal. In other words, it would seem that the participants in this study hold concrete expectations about the probable effect of common work-role demands since they overwhelmingly opt against the neutral position on the scale.

A.2 Strain Scale Evaluations

Table A.4 shows the results from a sequence of backward regression analyses which explored the effectiveness or the ability of the OSI strain scales to capture or account for the nature of the personal (i.e., transactional) relationship with common work-role stressors and the expectancy of common work-role stressors. Alternatively, it is feasible to argue that either (a) the specificity of common work stressors, or (b) the contextual relevance of work stressors may in effect determine the mode of strain in a particular context. For example, airline pilots may experience aspects of interpersonal (e.g., family related) strain due to the transient nature of their work but not necessarily

vocational, psychological or physical types of strain. In contrast, rotating shift workers will invariably report symptoms of physical strain or a general malaise (i.e., minor health complaints) due to the effects of fatigue from sleep deprivation (e.g., Smith & Bennett, 1983). In other words, manifestations of strain related outcomes may in effect be stressor specific or alternatively, context specific. As a consequence, the more inclusive and parsimonious approach to this issue is to employ context general measures of strain which embrace the spectrum of strain dimensions, that is, collapse the types of strain related outcomes into a generic measure of strain (Osipow & Spokane, 1984). Hence, the objective of these analyses was to evaluate how well specific and composite measures of strain are able to capture the transactional nature of common work stressors and the personal meaning assigned to sources of stress.

The results from both the common stressor and expectancy models indicate a wide variability in the ability of the strain scales to capture the transactional nature of common and personal meaning sources of stress. For example, the Interpersonal Strain scale accounts for only 13.44% (adj) of the variance in strain when used with the common stressor model; conversely, the Composite Strain scale accounts for a substantially higher 35.51% (adj) of the variance in strain when used with the common stressor/role-expectancy model.

From the results for the individual OSI strain scales, the Vocational Strain scale explained the highest amount of variance from the effect of both common stressor work demands and the personal meaning assigned to common work demands. For example, the common stressor model explained 32.43% (adj) of the variance and the common stressor/expectancy model a slightly higher 34.81% (adj) of the variance in vocational

strain. Conversely, the Interpersonal Strain scale was the least effective measure of strain. It explained a low 13.44% (adj) of the variance when used with the common stressor model; an increased 18.14% (adj) when used with the common stressor/ expectancy model; and a similar 17.66% (adj) when used with the common stressor/role-expectancy model.

The results for the models using the Vocational Strain scale, however, may in effect be inflated by the underlying effect of method variance on the measurement of the stressor to strain process (Spector & Brannick, 1995). That is, the variance explained by the scale may actually be an artefact induced by the semantic overlap of the stressor and strain scales (Hurrell Jr. et al, 1998; Karasek et al., 1998; Kasl, 1978; Lazarus et al., 1985; Lazarus & Folkman, 1986; Parkes, 1982; Pratt & Barling, 1988). When compared to the models using the Composite Strain scale, the variance explained by the models using this scale would seem to be somewhat inflated. Furthermore, a review of the correlation matrix shows that the correlations between the OSI Role-Boundary and Role-Insufficiency common stressor scales and Vocational Strain (i.e., 0.54** & 0.44** respectively) are both higher than the average for the OSI strain scales. Inter-item correlations between the items in the Role-Stressor and Vocational Strain scales failed to identify any substantial overlap or multicollinearity (i.e., greater than 0.70) between the items in these scales. For instance, for those with the Role-Boundary scale, the highest correlations between the items in this scale and the strain items was 0.62** (i.e., items 35 and 8) and 0.57** (i.e., items 37 and 8). Similarly, for the Role-Insufficiency scale, the highest correlation between the items in this scale and the strain items was 0.59** (i.e., items 13 and 3).

Table A.4
Backward Regression: OSI Strain Scale Evaluations

Model##	Descriptive		Descriptive/Belief		Descriptive/Role-Belief	
OSI Strain Scale	Final Equation#	Rsqr (adj)	Final Equation#	Rsqr (adj)	Final Equation#	Rsqr (adj)
Vocational	Role-Boundary Role-Insufficiency	32.43	Role-Boundary Role-Insufficiency Expect R-Response	34.81	Role-Boundary Role-insufficiency Expect R-Response	33.75
Psychological	Role-Boundary Role-Ambiguity Role-Responsibility	21.35	Role-Boundary Role-Ambiguity Expect R-Bound Expect R-O'Load	26.08	Role-Expectancy Role-Boundary Role-Ambiguity	25.58
Interpersonal	Role-Ambiguity Role-Responsibility	13.44	Role-Ambiguity Expect R-O'Load	18.14	Role-Ambiguity Role-Expect	17.66
Physical	Role-Boundary Role-Responsibility	17.05	Role-Boundary Expect R-Bound	19.44	Role-Boundary Role-Expect	19.75
Composite Strain	Role-Boundary Role-Ambiguity Role-Responsibility	30.44	Role-Boundary Role-Ambiguity Expect R-Bound Expect R-O'Load	35.47	Role-Boundary Role-Expect Role-Ambiguity	35.51

Note: 1) #Variables in Final Equation: (a) Prob of t Value ≤ .05; (b) Shown in Order of Significance 2) ##Variables in the Model: (a) OSI Stressor Model - Six OSI Common Stressor Scales; OSI Common Stressor/Expectancy Model - Six OSI Common Stressor and Six Expectancy Scales; OSI Common Stressor/Role-Expectancy Model - Six OSI Common Stressor Scales, Role-Expectancy Scale and Expectancy Physical Environment Scale.

When seen in terms of a semantic overlap between the scales , however, the semantic carry-over between the items in the respective scales is more explicit. For the Role-Boundary scale, item 35 asks the question: "I feel good about the work I do"; item 37, "I am proud of what I do for a living"; and item 8 for the Vocational Strain scale, "I find my work interesting and/or exciting". Similarly, for the Role-Insufficiency scale, item 13 asks: "I am bored with my job"; and item 3 of the Vocational Strain scale, "I am bored with my work". Clearly, there exists a degree of semantic similarity between the items which may in effect reflect as increased correlations between the items and

thereby inflate the variance explained by the model. Consequently, there are grounds to suggest that items 3 and 8 of the Vocational Strain scale should be deleted from the scale.

However, with respect to the Composite Strain scale, the issue of redundancy is not so clearcut. Items 35 and 37 from the Role-Boundary scale correlate 0.27** and 0.25** with the Composite Strain scale; and item 13 from the Role-Insufficiency scale, a slightly higher 0.33** with the Composite Strain scale. As such, there are grounds to suggest that these items do not contribute exaggerated information to the variability of this scale and therefore should not be removed from the scale.

Further, with regard to the efficacy of relationship between the models and measures of strain, the OSI common stressor model explains the smallest amount of the variance in the response to each of the strain scales. For the personal meaning models, however, the inclusion of expectancy scales in the model accounts for variance in each of the strain scales beyond that explained by the OSI common stressor model. For example, in comparison to the 21.34% (adj) explained by OSI common stressor model, the OSI common stressor/role-expectancy model explains an increased 25.58% (adj) of the variance in the Psychological Strain scale. By contrast, when related to the Composite Strain scale, the OSI common stressor model explains 30.44% (adj) of the variance in the scale and the OSI common stressor/role-expectancy model, a substantially higher 35.51% (adj) of the variance in the Composite Strain scale. Thus, taken overall, the Composite Strain scale provides the most effective relationship with sources of stress, but not necessarily the most parsimonious method by which to tap the nature of transactional process underlying strain related outcomes.

Finally, with regard the issue of specificity, the results provide little support for the notion that dimensions of strain may relate to specific sources of stress. For example, the OSI Role-Boundary common stressor and Expectancy Role-Boundary scales tend to load in the majority of the solutions. As a result, the data indicates that common stressor and personal meaning sources of stress are in effect common to self-reports of physiological, psychological, occupational and social symptoms of strain.

There is, however, implicit support, albeit rather small, for the notion that types of strain are context specific. That is, that the nature of contextual factors reflects in specific types of strain. For example, the Role-Insufficiency and Expectancy Role-Responsibility scales load on the Vocational strain scale; and the Role-Ambiguity, Role-Responsibility and Expectancy Role-Overload scales on the Interpersonal Strain scale. In other words, each of these relationships with strain is in effect determined by organisational policies concerning the design and regulation of work. Those involving: (a) the scope of work tasks (i.e., the use of skills and abilities); (b) the structure of work practices (i.e., degree of ambiguity in work practices); and (c) the responsibility and demands assigned to a particular job-role (i.e., the degree of autonomy and expected proficiency for an assigned task). Such distinctions, however, are in effect subsumed by the use of generic strain scales. As the data indicates, the Composite Strain scale captured a wide range of both common work stressor and personal meaning effects and furthermore, explained the highest amount of the variance in strain.

Appendix A.3

Work Stress Questionnaire

WORK STRESS QUESTIONNAIRE

CONSENT FORM

MY NAME IS TOM ABSON AND I AM CURRENTLY ENROLLED IN THE B.A. HONOURS COURSE IN THE DEPARTMENT OF PSYCHOLOGY AT THE UNIVERSITY OF WOLLONGONG. A COURSE REQUIREMENT IS THAT I MUST SUBMIT A THESIS (RESEARCH PROJECT) THAT IS AN ORIGINAL STUDY IN A CHOSEN AREA OF PSYCHOLOGY. MY INTERESTS ARE IN THE AREA OF HUMAN EMOTIONS AND THE EVALUATION OF STATISTICAL ANALYSES THAT MEASURE THE DIFFERENCE BETWEEN INDIVIDUALS AND GROUPS OF PEOPLE. THE QUESTIONNAIRES THAT I WOULD LIKE YOU TO COMPLETE ARE THEREFORE INTENDED TO INVESTIGATE MY AREA OF INTEREST.

IF YOU WOULD LIKE TO PARTICIPATE IN THIS RESEARCH WHICH SHOULD TAKE AROUND 40 MINUTES OF YOUR TIME, PLEASE INDICATE IN THE BOX BELOW. YOU ARE UNDER NO OBLIGATION TO COMPLETE THE QUESTIONNAIRES AND THEREFORE FREE TO WITHDRAW AT ANY TIME. ALL INFORMATION ON THE QUESTIONNAIRES IS STRICTLY CONFIDENTIAL AND WILL BE DESTROYED AT THE CONCLUSION OF MY RESEARCH. HOWEVER, MY RESEARCH FINDINGS WILL BE SUMMARISED AND MADE AVAILABLE FOR ANYONE WHO MIGHT BE INTERESTED IN MY CONCLUSIONS.

WOULD LIKE TO PARTICIPATE ☐ (Please Tick)

THANKING YOU FOR YOUR PARTICIPATION

TOM ABSON
AVIONICS: ELECTRONIC SERVICING
HANGAR 131 PHONE EXT. 27921

PLEASE NOTE: THIS RESEARCH IS CONDUCTED WITH COMPANY APPROVAL. THE RESEARCH AND RESULTS ARE NOT FOR COMPANY PURPOSES

Appendix A.3.1

Work Stressor Valence Scale

Questionnaire 1

Please read before turning the page

Work Stressor Valence Scale

EACH OF US BELIEVES THAT THERE ARE THINGS AT WORK THAT ARE GOOD OR BAD FOR US AND WHICH THEREFORE INFLUENCE OUR JOB PERFORMANCE.

FOR EXAMPLE, SOME PEOPLE BELIEVE THAT OPEN-PLAN OFFICES ARE MOST DEFINITELY GOOD FOR THEM WHILST OTHERS, BELIEVE THAT OPEN-PLAN OFFICES ARE MOST DEFINITELY BAD FOR. THEM AND THEIR PERFORMANCE AT WORK.

WE DO NOT WANT TO KNOW WHETHER YOUR PRESENT JOB HAS THE FOLLOWING WORK FEATURES OR NOT.

RATHER, **WE WANT TO KNOW** WHAT YOU THINK ABOUT THESE WORK FEATURES - WHETHER YOU THINK THEY ARE GOOD OR BAD FOR YOU AND YOUR JOB PERFORMANCE.

PLEASE READ EACH ITEM AND THEN CIRCLE THE SCALE TO SHOW WHAT YOU THINK ABOUT THE ITEM.

FOR EXAMPLE, IF YOU THINK THAT WORKING IN AN OPEN-PLAN OFFICE WOULD NORMALLY BE GOOD FOR YOU AND YOUR .JOB PERFORMANCE THEN YOU WOULD REPLY THUS:

MOST DEFINITELY GOOD	+3
NORMALLY GOOD	(+2)
SOMETIMES GOOD	+1
NOT SURE	0
SOMETIMES BAD	-1
NORMALLY BAD	-2
MOST DEFINITELY BAD	-3

BUT, IF YOU THINK THAT WORKING IN AN OPEN-PLAN OFFICE WOULD NORMALLY BE BAD FOR YOU AND YOUR JOB PERFORMANCE THEN YOU WOULD REPLY THUS:

MOST DEFINITELY GOOD	+3
NORMALLY GOOD	+2
SOMETIMES GOOD	+1
NOT SURE	0
SOMETIMES BAD	-1
NORMALLY BAD	(-2)
MOST DEFINITELY BAD	-3

NOW PLEASE TURN OVER THE PAGE AND ANSWER THE FOLLOWING 12 QUESTIONS BY CIRCLING THE NUMBER WHICH BEST REPRESENTS YOUR ANSWER USING THE SEVEN POINT SCALE.

REMEMBER

+3	+2	+1	0	-1	-2	-3
Most Definitely Good	Normally Good	Sometimes Good	Not Sure	Sometimes Bad	Normally Bad	Most Definitely Bad

Q1. JOB DEMANDS WHICH EXCEED PERSONAL AND COMPANY RESOURCES ARE:

GOOD +3 +2 +1 0 -1 -2 -3 BAD

Q2. BEING UNABLE TO ACCOMPLISH THE WORK LOAD EXPECTED OF ME IS:

GOOD +3 +2 +1 0 -1 -2 -3 BAD

Q3. BEING UNCERTAIN OF WHAT IS EXPECTED FROM ONE AT WORK IS:

GOOD +3 +2 +1 0 -1 -2 -3 BAD

Q4. HAVING NO CLEAR SENSE OF WHAT IS NEEDED IN ORDER TO ACHIEVE PROMOTION IS:

GOOD +3 +2 +1 0 -1 -2 -3 BAD

Q5. SUPERVISORS HAVING CONFLICTING IDEAS ABOUT WHAT A PERSON'S JOB REQUIRES THEM TO DO IS:

GOOD +3 +2 +1 0 -1 -2 -3 BAD

Q6. CONFLICTING LOYALTIES AT WORK ARE:

GOOD +3 +2 +1 0 -1 -2 -3 BAD

REMEMBER

+3	+2	+1	0	-1	-2	-3
Most Definitely Good	Normally Good	Sometimes Good	Not Sure	Sometimes Bad	Normally Bad	Most Definitely Bad

Q7. A POOR FIT BETWEEN EDUCATION, JOB TRAINING AND JOB SKILLS AND THE WORK ONE DOES IS:

GOOD +3 +2 +1 0 -1 -2 -3 BAD

Q8. A JOB THAT DOES NOT RECOGNISE OR TAKE ADVANTAGE OF WORK EXPERIENCE IS:

GOOD +3 +2 +1 0 -1 -2 -3 BAD

Q9. BEING RESPONSIBLE FOR THE PERFORMANCE OF OTHERS AT WORK 1S:

GOOD +3 +2 +1 0 -1 -2 -3 BAD

Q10. TO BE RESPONSIBLE FOR THE WELFARE OF OTHERS AT WORK IS:

GOOD +3 +2 +1 0 -1 -2 -3 BAD

Q11. IRREGULAR AND SOMETIMES LONG WORK HOURS ARE:

GOOD +3 +2 +1 0 -1 -2 -3 BAD

Q12. EXPOSURE TO EXTREME AND/OR CHANGING ENVIRONMENTAL CONDITIONS AT WORK SUCH AS NOISE, HEAT AND WEATHER IS:

GOOD +3 +2 +1 0 -1 -2 -3 BAD

End of Questionnaire 1

Appendix A.3.2

Biographical Data

SOME QUESTIONS ABOUT YOU

WE NEED SOME PERSONAL DETAILS ABOUT YOURSELF. PLEASE COMPLETE THE QUESTIONS LISTED BELOW:

Q1. SEX MALE _____ FEMALE _____

Q2. LIVING STATUS: MARRIED/DE FACTO _____ SINGLE _____

Q3. YOUR AGE IN YEARS: _____

Q4. YOUR JOB CLASSIFICATION: _____
(EG. CONTROLLER, GEN. FOREMAN, LAME-AIRFRAME, GROUND ENGINEER-ELECTRONICS, PLANNER, ETC.)

Q5. YOUR JOB ROLE (GENERALLY):

SUPERVISOR	_____
ACTING SUPERVISOR	_____
NON-SUPERVISORY	_____
INSTRUCTOR	_____
OTHER(PLEASE SPECIFY)	_____
	_____

Q6. WORK PATTERN:

DAY, AFTERNOON AND NIGHT SHIFT	_____
DAY AND AFTERNOON 7 DAY SHIFT	_____
DAY AND AFTERNOON MONDAY/FRIDAY	_____
DAY WORKER 7 DAY SHIFT	_____
DAY WORKER MONDAY/FRIDAY	_____

Q7. YEARS OF SERVICE WITH COMPANY YEARS ____ MONTHS ____

Q8. TIME IN CURRENT POSITION: YEARS ____ MONTHS ____

Q9. TIME IN CURRENT TRADE/PROFESSIONAL AREA: YEARS ____ MONTHS ____

Q10. JOB LOCATION:

MAIN BASE/SIT	____
CITY	____
OUTSTATION WITHIN AUSTRALIA	____
OUTSTATION OUTSIDE AUSTRALIA	____

End of Questionnaire 2

Appendix A.3.3

The Way You Behave Generally Scale
(Type A Behaviour)

Questionnaire 3

The way you behave generally

Quite apart from feelings and reactions, the way you approach things and your overall style of behaviour are important. In this questionnaire you are required to record the extent to which you agree or disagree with statements about yourself and your behaviour.

Please answer by circling the number which indicates the extent of your agreement/disagreement.

Very strongly agree	6
Strongly agree	5
Agree	4
Strongly disagree	3
Very strongly disagree	1

1.	Because I am satisfied with life I am not an especially ambitious person who has a need to succeed or progress in their career	6	5	4	3	2	1
2	My impatience with slowness means for example that when talking with other people my mind tends to race ahead and I anticipate what the person is going to say	6	5	4	3	2	1
3	I am a fairly confident and forceful individual who has no qualms about expressing feelings or opinions in an authoritative and assertive manner	6	5	4	3	2	1
4	I am not an especially achievement-oriented person who continually behaves in a competitive way or who has a need to win or excel in whatever I do	6	5	4	3	2	1
5	When I am do something, I concentrate on only one activity a t a time and am fully committed in giving it 100% of my effort	6	5	4	3	2	1
6	I would describe the manner of my behaviour as being-quite challenging and vigorous	6	5	4	3	2	1
7	When I compare myself with others I know, I would say that I am more responsible, serious, conscientious and competitive than they are	6	5	4	3	2	1
8	I am usually quite concerned to learn about other people's opinions of me particularly recognition others give me	6	5	4	3	2	1
9	Even though I take my job seriously, I could not be described as being completely and absolutely dedicated to it	6	5	4	3	2	1
10	I have a heighten pace of living in that I do things quickly such as eating, talking, walking and so on	6	5	4	3	2	1
11	When I am establishing priorities, work does not always come first because although it is important, I have other outside interests which I also regard as important	6	5	4	3	2	1
12	I am a fairly easy going individual, who takes life as it comes and who is not especially 'action oriented'	6	5	4	3	2	1
13	I am a very impatient sort of person who finds waiting around difficult especially for other people	6	5	4	3	2	1
14	I am time conscious and lead my life on a 'time is money and can't be wasted' principle	6	5	4	3	2	1

End of Questionnaire 3

Appendix A.3.4

How You Interpret Events Around You Scale (Locus of Control)

Questionnaire 4

How you interpret events around you

The object of this questionnaire is to record how much you feel you can or cannot influence the things that go on around you. You are asked to indicate your level of agreement to the following statements.

Please answer by circling the number which indicates the extent of your agreement/disagreement.

Very strongly agree	6
Strongly agree	5
Agree	4
Strongly disagree	3
Very strongly disagree	1

1	The trouble with workers nowadays is that they are subject to too many constraints and punishments.	6	5	4	3	2	1
2	Assessments of performance do not reflect the way and how hard individuals work.	6	5	4	3	2	1
3	With enough effort it is possible for employees generally, to have some influence over top management and the way they behave.	6	5	4	3	2	1
4	It is not possible to draw up plans too far ahead because so many things can occur that make the plans unworkable.	6	5	4	3	2	1
5	Socialising is an excellent way to develop oneself and an emphasis on such things in organisations is important.	6	5	4	3	2	1
6	Even though some people try to control company events by taking part in social affairs or office politics, most of us are subject to influences we can neither comprehend nor control.	6	5	4	3	2	1
7	Being successful and getting to be 'boss' depends on ability - being in the right place at the right time or luck have little to do with it.	6	5	4	3	2	1
8	Management can be unfair when appraising subordinates since their performance is often influenced by accidental events.	6	5	4	3	2	1
9	Being an effective leader is more often a function of personal skills than it is of taking advantage of every available opportunity	6	5	4	3	2	1
10	It is upper management rather that ordinary employees who are responsible for poor company performance at an overall level.	6	5	4	3	2	1
11	The things that happen to people are more under their control than a function of luck or chance.	6	5	4	3	2	1
12	In organisations that are run by a few people who hold the power, the average individual can have little influence over organisational decisions.	6	5	4	3	2	1

End of Questionnaire 4

Appendix A.3.5

Work Stressor Expectancy Scale

Questionnaire 5

Please read before turning the page

Work Stressor Expectancy Scale

EACH OF US BELIEVE THAT THERE ARE ASPECTS OF OUR JOB THAT WILL CAUSE US STRESS WHEN AT WORK.

FOR EXAMPLE, SOME PEOPLE BELIEVE THAT A LOUD AND CONSISTENT BACKGROUND NOISE AT WORK MOST CERTAINLY WILL CAUSE THEM STRESS AND OTHERS, THAT A LOUD AND CONSISTENT BACKGROUND NOISE MOST CERTAINLY WILL NOT CAUSE THEM TO FEEL STRESS.

LISTED OVER THE PAGE ARE A NUMBER OF QUESTIONS **ABOUT WORK.**

WE **DO NOT WANT TO KNOW** WHETHER THESE CHARACTERISTICS ABOUT WORK CAUSE PEOPLE STRESS.

RATHER, **WE WANT TO KNOW** HOW LIKELY **YOU BELIEVE** EACH OF THESE FEATURES ABOUT WORK WILL OR WILL NOT CAUSE YOU STRESS AT WORK.

PLEASE READ EACH ITEM CAREFULLY AND THEN CIRCLE THE SCALE TO SHOW WHAT YOU THINK ABOUT THE ITEM.

FOR EXAMPLE, IF YOU BELIEVE THAT A LOUD AND CONSISTENT BACKGROUND NOISE AT WORK CERTAINLY WILL CAUSE YOU STRESS THEN YOU WOULD REPLY THUS:

MOST CERTAINLY WILL	+3
CERTAINLY WILL	(+2)
SOMETIMES WILL	+1
NOT SURE	0
UNLIKELY	-1
VERY UNLIKELY	-2
MOST CERTAINLY WILL NOT	-3

BUT, IF YOU BELIEVE THAT A LOUD AND CONSISTENT BACKGROUND NOISE AT WORK WILL BE VERY UNLIKELY TO CAUSE YOU STRESS THEN YOU WOULD REPLY THUS:

MOST CERTAINLY WILL	+3
CERTAINLY WILL	+2
SOMETIMES WILL	+1
NOT SURE	0
UNLIKELY	-1
VERY UNLIKELY	(-2)
MOST CERTAINLY WILL NOT	-3

NOW PLEASE TURN OVER THE PAGE AND ANSWER THE FOLLOWING 12 QUESTIONS BY CIRCLING THE NUMBER WHICH BEST REPRESENTS YOUR ANSWER USING THE SEVEN POINT SCALE.

REMEMBER

+3	+2	+1	0	-1	-2	-3
Most Definitely Good	Normally Good	Sometimes Good	Not Sure	Sometimes Bad	Normally Bad	Most Definitely Bad

---

Q1. JOB DEMANDS EXCEEDING MY PERSONAL AND COMPANY RESOURCES WILL CAUSE ME STRESS:

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

Q2. BEING UNABLE TO ACCOMPLISH THE WORKLOAD EXPECTED OF ME WILL CAUSE ME STRESS:

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

Q3. BEING UNCERTAIN OF WHAT IS EXPECTED OF ME AT WORK WILL CAUSE ME STRESS:

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

Q4. HAVING NO CLEAR SENSE OF WHAT I NEED TO ACHIEVE IN ORDER TO BE PROMOTED WILL CAUSE ME STRESS:

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

Q5 MY SUPERVISORS HAVING CONFLICTING IDEAS ABOUT WHAT MY JOB REQUIRES WILL CAUSE ME STRESS:

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

Q6 HAVING CONFLICTING LOYALTIES AT WORK WILL CAUSE ME STRESS:

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

REMEMBER

+3	+2	+1	0	-1	-2	-3
Most Definitely Good	Normally Good	Sometimes Good	Not Sure	Sometimes Bad	Normally Bad	Most Definitely Bad

---

Q7 A POOR FIT BETWEEN MY EDUCATION, JOB TRAINING AND JOB SKILLS AND THE WORK I PERFORM WILL CAUSE ME STRESS:

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

Q8 A JOB THAT DOES NOT RECOGNISE OR TAKE ADVANTAGE OF MY WORK EXPERIENCE WILL CAUSE ME STRESS:

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

Q9. BEING RESPONSIBLE FOR THE WORK PERFORMANCE OF OTHERS WILL CAUSE ME STRESS:

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

Q10 BEING RESPONSIBLE FOR THE WELFARE OF OTHERS AT WORK WILL CAUSE ME STRESS:

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

Q11 IRREGULAR AND SOMETIMES LONG WORK HOURS WILL CAUSE ME STRESS:

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

Q12. EXPOSURE TO EXTREME AND/OR CHANGING ENVIRONMENTAL CONDITIONS AT WORK SUCH AS NOISE, HEAT AND WEATHER WILL CAUSE ME STRESS

LIKELY +3 +2 +1 0 -1 -2 -3 UNLIKELY

End of Questionnaire 5

Appendix A.3.6

Occupational Environment Scales (OES)

Questionnaire 6

PLEASE READ BEFORE TURNING THE PAGE.

OCCUPATIONAL ENVIRONMENT SCALES, FORM E-2

This measure is called the Occupational Environment Scales. It is designed to measure different kinds of stresses people experience in their work. On the answer sheet you'll notice that 5 stands for most of the time, and 1 for rarely. Read each statement and circle whichever of the five responses seems to fit you best for each statement. Notice that responses 2,3 and 4 also have descriptive labels. Please be sure to respond to all 60 items, even if it is difficult to do so. Circle the most appropriate response.

FOR RESEARCH PURPOSES ONLY

	Most of the Time	Usually	Often	Occasionally	Rarely or Never				
	1	2	3	4	5				
1.	At work I am expected to do too many different tasks in too little time.				5	4	3	2	1
2.	I feel that my job responsibilities are increasing.				5	4	3	2	1
3.	I am expected to perform tasks on my job for which I have never been trained.				5	4	3	2	1
4.	I have to take work home with me.				5	4	3	2	1
5.	I have the resources I need to get my job done.				5	4	3	2	1
6.	I feel competent in what I do.				5	4	3	2	1
7.	I work under tight time deadlines.				5	4	3	2	1
8.	I wish that I had more time to deal with the demands placed upon me at work,				5	4	3	2	1
9.	My job requires me to work in several equally important areas at once.				5	4	3	2	1
I0.	I am expected to do more work than is reasonable.				5	4	3	2	1
11.	I feel that my career is progressing about as I hoped it would.				5	4	3	2	1
12.	I feel that my job fits my skills and interests.				5	4	3	2	1
13.	I am bored with my job.				5	4	3	2	1
14.	I feel I have enough responsibility on my job.				5	4	3	2	1
15	I feel I have enough responsibilities on my job.				5	4	3	2	1
16.	I feel my job has a good future.				5	4	3	2	1
17.	I am able to satisfy my need for success and recognition in my job.				5	4	3	2	1
18.	I feel overqualified in my job.				5	4	3	2	1
19.	I learn new skills in my work.				5	4	3	2	1
20.	I have to perform tasks that are beneath my ability				5	4	3	2	1

FOR RESEARCH PURPOSES ONLY

	Most of the Time	Usually	Often	Occasionally	Rarely or Never				
	1	2	3	4	5				
21.	My supervisor provides me with useful feedback about my performance.	5	4	3	2	1			
22.	It is clear to me what I have to do to get ahead.	5	4	3	2	1			
23.	I am uncertain about what I am supposed to accomplish in my work.	5	4	3	2	1			
24.	When faced with several tasks I know which should be done first.	5	4	3	2	1			
25.	I know where to begin a new project when it is assigned to me.	5	4	3	2	1			
26.	My supervisor asks for one thing, but really wants another.	5	4	3	2	1			
27.	I understand what is acceptable personal behaviour on the job (e.g. dress, interpersonal relations etc.).	5	4	3	2	1			
28.	The priorities of my job are clear to me.	5	4	3	2	1			
29.	I have a clear understanding of how my boss wants me to spend my time.	5	4	3	2	1			
30.	I know the basis on which I am evaluated.	5	4	3	2	1			
31.	I feel conflict between what my employer expects me to do and what I think is right or proper.	5	4	3	2	1			
32.	I feel caught between factions at work.	5	4	3	2	1			
33.	I have more than one person telling me what to do.	5	4	3	2	1			
34.	I feel I have a stake in the success of my employer (or enterprise).	5	4	3	2	1			
35.	I feel good about the work I do.	5	4	3	2	1			
36.	My supervisors have conflicting ideas about what I should be doing.	5	4	3	2	1			
37.	I am proud of what I do for a living.	5	4	3	2	1			
38.	It is clear who really runs things where I work.	5	4	3	2	1			
39.	I have divided loyalties on my job.	5	4	3	2	1			

FOR RESEARCH PURPOSES ONLY

	Most of the Time	Usually	Often	Occasionally	Rarely or Never				
	1	2	3	4	5				
40.	The work I do has as much payoff for me as for my employer.				5	4	3	2	1
41.	I feel I deal with more people during the day than I prefer.				5	4	3	2	1
42.	I spend time concerned with the problems others at work bring to me.				5	4	3	2	1
43.	I am responsible for the welfare of subordinates.				5	4	3	2	1
44.	People on the job look to me for leadership.				5	4	3	2	1
45.	I have on the job responsibility for the activities of others.				5	4	3	2	1
46.	I worry about whether the people who work for/with me will get things done properly.				5	4	3	2	1
47.	People who work for/with me are really hard to deal with.				5	4	3	2	1
48.	If I make a mistake in my work, the consequences for others can be pretty bad.				5	4	3	2	1
49.	My job demands that I handle an angry public.				5	4	3	2	1
50.	I like the people I work with.				5	4	3	2	1
51.	On my job I am exposed to high levels of noise.				5	4	3	2	1
52.	On my .job I am exposed to high levels of wetness.				5	4	3	2	1
53.	On my job I am exposed to high levels of dust.				5	4	3	2	1
54.	On my job I am exposed to high temperatures.				5	4	3	2	1
55.	On my job I am exposed to bright light.				5	4	3	2	1
56.	On my job I am exposed to low temperatures.				5	4	3	2	1
57.	I have an erratic work schedule.				5	4	3	2	1
58.	On my job I am exposed to personal isolation.				5	4	3	2	1
59.	On my job I am exposed to unpleasant odours.				5	4	3	2	1
60.	On my job I am exposed to poisonous substances.				5	4	3	2	1

End of Questionnaire 6

Appendix A.3.7

Personal Strain Questionnaire (PSQ)

Questionnaire 7

PLEASE READ BEFORE TURNING THE PAGE.

PERSONAL STRAIN QUESTIONNAIRE, FORM E-2

This instrument is called the Personal Strain Questionnaire. It is designed to measure different kinds of strains people experience in their lives. On the answer sheet you'll notice that 5 stands for most of the time, and I for rarely. Read each statement and circle whichever of the five responses describes you best for each statement. Notice that responses 2, 3, and 4 also have descriptive labels. Please be sure to respond to all 40 items, even if it is difficult to do so. Circle the most appropriate response.

FOR RESEARCH PURPOSES ONLY

	Most of the Time	Usually	Often	Occasionally	Rarely or Never				
	1	2	3	4	5				
1.	I don't seem to be able to get much done at work.				5	4	3	2	1
2.	I dread going to work, lately.				5	4	3	2	1
3.	I am bored with my work.				5	4	3	2	1
4.	I find myself getting behind in my work, lately.				5	4	3	2	1
5.	I have accidents on the job of late.				5	4	3	2	1
6.	The quality of my work is good.				5	4	3	2	1
7.	Recently, I have been absent from work.				5	4	3	2	1
8.	I find my work interesting and/or exciting.				5	4	3	2	1
9.	I can concentrate on the things I need to at work.				5	4	3	2	1
10.	I make errors or mistakes in my work.				5	4	3	2	1
11.	Lately, I am easily irritated.				5	4	3	2	1
12.	Lately, I have been depressed.				5	4	3	2	1
13.	Lately, I have been feeling anxious.				5	4	3	2	1
14.	I have been happy, lately.				5	4	3	2	1
15.	So many thoughts run through my head at night that I have trouble failing asleep.				5	4	3	2	1
16.	Lately, I respond badly in situations that normally wouldn't bother me.				5	4	3	2	1
17	I find myself complaining about little things.				5	4	3	2	1
18.	Lately, I have been worrying.				5	4	3	2	1
19.	I have a good sense of humour.				5	4	3	2	1
20.	Things are going about as they should.				5	4	3	2	1

FOR RESEARCH PURPOSES ONLY

	Most of the Time	Usually	Often	Occasionally	Rarely or Never				
	1	2	3	4	5				
21.	I wish I had more time to spend with close friends.				5	4	3	2	1
22.	I quarrel with my spouse.				5	4	3	2	1
23.	I quarrel with my friends.				5	4	3	2	1
24.	My spouse and I are happy together.				5	4	3	2	1
25.	Lately, I do things by myself instead of with other people.				5	4	3	2	1
26.	I quarrel with members of the family.				5	4	3	2	1
27.	Lately, my relationships with people are good.				5	4	3	2	1
28.	I find that I need time to myself to work out my problems.				5	4	3	2	1
29.	I wish I had more time to spend by myself.				5	4	3	2	1
30.	I have been withdrawing from people lately.				5	4	3	2	1
31.	I have unplanned weight gains.				5	4	3	2	1
32.	My eating habits are erratic.				5	4	3	2	1
33.	I find myself drinking a lot lately.				5	4	3	2	1
34.	Lately, I have been tired.				5	4	3	2	1
35.	I have been feeling tense.				5	4	3	2	1
36.	I have trouble falling and staying asleep.				5	4	3	2	1
37.	I have aches and pains I can not explain.				5	4	3	2	1
38.	I eat the wrong foods.				5	4	3	2	1
39.	I feel apathetic.				5	4	3	2	1
40.	I feel lethargic.				5	4	3	2	1

End of Questionnaire 7

Appendix A.3.8

Personal Resources Questionnaire (PRQ)

Questionnaire 8

PLEASE READ BEFORE TURNING THE PAGE.

THE PERSONAL RESOURCES QUESTIONNAIRE, FORM E-2

This instrument is called the Personal Resources Questionnaire. It is designed to measure the extent to which resources arc available to people to counteract the effects of occupational stress. On the answer sheet you'll notice that 5 stands for most of the time, and I for rarely. Read each statement and circle whichever of the five responses seems to fit you best for each statement. Notice that responses 2, 3, and 4 also have descriptive labels. Please be sure to respond to all 40 items, even of it is difficult to do so. Circle the most appropriate response.

FOR RESEARCH PURPOSES ONLY

		Most of the Time 1	Usually 2	Often 3	Occasionally 4	Rarely or Never 5				
1.	When I need a vacation I take one.	5	4	3	2	1				
2.	I am able to do what I want to in my free time.	5	4	3	2	1				
3.	On weekends I spend time doing the things I enjoy	5	4	3	2	1				
4.	Lately, my main recreational activity is watching television.	5	4	3	2	1				
5.	A lot of my free time is spent attending performances (e.g. sporting events, theatre, movies, concerts, etc).	5	4	3	2	1				
6.	I spend a lot of my free time in participant activities (e.g. sports, music, painting, woodworking, sewing, etc).	5	4	3	2	1				
7.	I spend a lot of my time in community activities (e.g. scouts, religious, school, local government etc).	5	4	3	2	1				
8.	I find engaging in recreational activities relaxing.	5	4	3	2	1				
9.	I spend enough time in recreational activities to satisfy my needs.	5	4	3	2	1				
10.	I spend a lot of my free time on hobbies (e.g. collections of various kinds etc).	5	4	3	2	1				
11.	I am careful about my diet (e.g. eating regularly, moderately, and with good nutrition in mind).	5	4	3	2	1				
12.	I get regular physical checkups.	5	4	3	2	1				
13.	I avoid excessive use of alcohol.	5	4	3	2	1				
14.	I exercise regularly (at least 20 minutes most days).	5	4	3	2	1				
15.	I practice "relaxation" techniques.	5	4	3	2	1				
16.	I get the sleep I need.	5	4	3	2	1				
17.	I avoid eating the things I know are unhealthy (e.g. coffee, tea, cigarettes etc).	5	4	3	2	1				
18.	I engage in meditation.	5	4	3	2	1				
19.	I practice deep breathing exercises a few minutes several times a day.	5	4	3	2	1				
20.	I set aside time to do the things I really enjoy.	5	4	3	2	1				

FOR RESEARCH PURPOSES ONLY

		Most of the Time 1	Usually 2	Often 3	Occasionally 4	Rarely or Never 5				
21.	There is at least one person important to me who values me.	5	4	3	2	1				
22.	I have help with the tasks around the house.	5	4	3	2	1				
23.	I have help with the important things that have to be done.	5	4	3	2	1				
24.	There is at least one sympathetic person with whom I can discuss my concerns.	5	4	3	2	1				
25.	There is at least one sympathetic person with whom I can discuss my work problems.	5	4	3	2	1				
26.	I feel I have at least one good friend I can count on.	5	4	3	2	1				
27.	I feel loved.	5	4	3	2	1				
28.	There is a person with whom I feel really close.	5	4	3	2	1				
29.	I have a circle of friends who value me.	5	4	3	2	1				
30.	I gain personal benefit from participation in formal social groups (e.g. religious, political, professional organisations, etc).	5	4	3	2	1				
31.	I am able to put my job out of my mind when I go home.	5	4	3	2	1				
32.	I feel that there are other jobs I could do beside my current one.	5	4	3	2	1				
33.	I periodically re-examine or reorganise my work style and schedule.	5	4	3	2	1				
34.	I can establish priorities for the use of my time.	5	4	3	2	1				
35.	Once they are set I am able to stick to my priorities.	5	4	3	2	1				
36.	I have techniques to help avoid being distracted.	5	4	3	2	1				
37.	I can identify important elements of problems I encounter.	5	4	3	2	1				
38.	When faced with a problem I use a systematic approach.	5	4	3	2	1				
39.	When faced with the need to make a decision I try to think through the consequences of choices I might make.	5	4	3	2	1				
40.	I try to keep aware of important ways I behave and things I do.	5	4	3	2	1				

End of Questionnaire 8

Appendix A.3.9

Perception of Work Stressors Scale

Questionnaire 9

Please read before turning the page

Perception of Work Stressors Scale

EACH OF US PERCEIVE OUR WORK IN DIFFERENT WAYS AND THEREFORE EACH OF US HAVE DIFFERENT IDEAS ON WHAT WE BELIEVE IS TRUE OR FALSE ABOUT OUR JOBS.

FOR EXAMPLE, SOME PEOPLE IF ASKED THE QUESTION: "WORK SAFETY PRACTICES ARE ENFORCED ON THE JOB", WOULD ANSWER MOST DEFINITELY TRUE AND OTHERS, MOST DEFINITELY FALSE.

LISTED OVER THE PAGE ARE A NUMBER OF QUESTIONS **ABOUT WORK**.

WE **DO WANT TO KNOW** IF THESE JOB CHARACTERISTICS ARE PRESENT IN YOUR WORK AREA.

PLEASE READ EACH ITEM CAREFULLY AND THEN CIRCLE THE SCALE TO SHOW THE EXTENT THAT EACH ITEM REFLECTS YOUR PRESENT JOB.

FOR EXAMPLE, IF WORK SAFETY PRACTICES ARE MOST ALWAYS ENFORCED WHEN YOU ARE AT WORK THEN YOU WOULD REPLY THUS:

MOST DEFINITELY TRUE	+3
MOST ALWAYS TRUE	(+2)
SOMETIMES	+1
NOT SURE	0
RARELY	-1
VERY RARELY	-2
MOST DEFINITELY FALSE	-3

BUT, IF WORK SAFETY PRACTICES ARE VERY RARELY ENFORCED WHEN YOU ARE AT WORK THEN YOU WOULD REPLY THUS:

MOST DEFINITELY TRUE	+3
MOST ALWAYS TRUE	+2
SOMETIMES	+1
NOT SURE	0
RARELY	-1
VERY RARELY	(-2)
MOST DEFINITELY FALSE	-3

NOW PLEASE TURN OVER THE PAGE AND ANSWER THE FOLLOWING 12 QUESTIONS BY CIRCLING THE NUMBER WHICH BEST REPRESENTS YOUR ANSWER USING THE SEVEN POINT SCALE.

REMEMBER, WE DO WANT TO KNOW ABOUT YOUR JOB AS IT REALLY IS

REMEMBER

+3	+2	+1	0	-1	-2	-3
Most Definitely True	Most Always True	Sometimes True	Not Sure	Rarely	Very Rarely	Most Definitely False

Q1. THE DEMANDS OF MY JOB EXCEED MY PERSONAL AND COMPANY RESOURCES:

TRUE +3 +2 +1 0 -1 -2 -3 FALSE

Q2. I AM UNABLE TO ACCOMPLISH THE WORK LOAD EXPECTED OF ME:

TRUE +3 +2 +1 0 -1 -2 -3 FALSE

Q3. I AM UNCERTAIN OF WHAT IS EXPECTED OF ME AT WORK:

TRUE +3 +2 +1 0 -1 -2 -3 FALSE

Q4. I HAVE NO CLEAR SENSE OF WHAT I NEED TO ACHIEVE IN ORDER TO BE PROMOTED:

TRUE +3 +2 +1 0 -1 -2 -3 FALSE

Q5. MY SUPERVISORS HAVE CONFLICTING IDEAS ABOUT WHAT MY JOB REQUIRES ME TO DO:

TRUE +3 +2 +1 0 -1 -2 -3 FALSE

Q6. I EXPERIENCE CONFLICTING LOYALTIES AT WORK:

TRUE +3 +2 +1 0 -1 -2 -3 FALSE

REMEMBER

+3	+2	+1	0	-1	-2	-3
Most Definitely True	Most Always True	Sometimes True	Not Sure	Rarely	Very Rarely	Most Definitely False

Q7. MY EDUCATION, TRAINING AND JOB SKILLS FIT POORLY THE WORK I PERFORM:

TRUE +3 +2 +1 0 -1 -2 -3 FALSE

Q8. MY JOB DOES NOT RECOGNISE OR TAKE ADVANTAGE OF MY WORK EXPERIENCE:

TRUE +3 +2 +1 0 -1 -2 -3 FALSE

Q9. I HAVE RESPONSIBILITY FOR THE WORK PERFORMANCE OF OTHERS:

TRUE +3 +2 +1 0 -1 -2 -3 FALSE

Q10. I AM RESPONSIBLE FOR THE WELFARE OF OTHERS AT WORK:

TRUE +3 +2 +1 0 -1 -2 -3 FALSE

Q11. MY JOB REQUIRES ME TO WORK IRREGULAR AND SOMETIMES LONG WORK HOURS:

TRUE +3 +2 +1 0 -1 -2 -3 FALSE

Q12. AT WORK I AM EXPOSED TO EXTREME AND/OR CHANGING ENVIRONMENTAL CONDITIONS SUCH AS NOISE, HEAT AND WEATHER:

TRUE +3 +2 +1 0 -1 -2 -3 FALSE

End of Questionnaire 9

Appendix B

Study 2

B.1 Results: Descriptive Sample

B.1.1 Descriptive Statistics

Descriptive statistics (n = 77) for the scale means, standard deviations (SD's), scale response range, skewness and internal consistency (i.e., Cronbach alpha coefficients) are shown in Table B.1. With respect to the mean scores for the OSI stressor scales and similarly for the OSI stressor (short) scales, the mean scores with the noticeable exception of the Role-Overload scales (i.e., 14.26 and 9.01) are all relatively similar. The basis for this result is evident from the observed range of the responses and the skew coefficients for both stressor dimensions. As the data shows, the observed range of responses for both role-overload scales is more broad than the response range for the other scales and the data more normally distributed (i.e., skew 0.26 and -0.12) than the other variables. In effect, the lower mean scores reflect the constriction in the range of responses and the positive skew coefficients for these variables toward the "no" or "sometimes" poles (i.e., response values of "0" or "1") of the response scale used for these scales. In other words, with the exception of the role-overload scales, there is a tendency for the data to be biased toward the non-stressful pole of the scales.

In comparison to the OSI scales, the mean scores for the expectancy and valence scales are noticeably higher than the mean scores for the OSI scales and tends to reflect constrictions in the observed range of responses and the associated negative skew of the data distribution. That is, there was a tendency for the participants to use the "very likely" and "mostly bad" poles (i.e., response value 3) of the respective expectancy and valence response scales. In particular, with the noticeable exception of the Role-Responsibility scale (skew = -0.02), the responses to the valence scales are all skewed in the negative direction. Similarly, from the responses to the expectancy scales, the

Role-Responsibility scale is the only scale that is normally distributed (skew = 0.09); furthermore, as a result of this minimal skewness, it has the lowest mean score (5.57) of the expectancy scales.

Table B.1
Descriptive Sample: Descriptive Statistics

Scale	Mean	SD	Scale Range#	Observed Range	Skew	Tran/Var Skew##	Alpha
Stressor (OSI)							
Role-Ambiguity	7.35	5.02	0 - 30	0 - 21	0.97	-0.21	.78
Role-Boundary	5.67	3.82	0 - 27#	0 - 15	0.67	0.25	.58
Role-Insufficiency	6.70	3.85	0 - 30	1 - 15	0.32	- -	.60
Role-Overload	14.26	4.30	0 - 27#	4 - 25	0.26	- -	.57
Role-Responsibility	4.61	3.20	0 - 24#	0 - 21	0.84	0.08	.57
Physical Environment	2.20	1.51	0 - 6	0 - 6	0.68	- -	-.01
Composite Scale#	38.66	13.77	0 - 138#	14 - 79	0.62	- -	.83
Stressor OSI (Short)							
Role-Ambiguity	3.60	2.92	0 - 15	0 - 12	1.10	-0.15	.68
Role-Boundary	2.82	2.60	0 - 15	0 - 10	0.88	-0.13	.60
Role-Insufficiency	4.91	3.10	0 - 15	0 - 13	0.59	0.27	.60
Role-Overload	9.01	3.28	0 - 15	0 - 15	-0.12	- -	.59
Role-Responsibility	2.43	2.46	0 - 15	0 - 10	1.17	0.02	.65
Composite Scale#	22.84	8.91	0 - 90	6 - 45	0.41	- -	.76
Expectancy (Short)							
Role-Ambiguity	9.60	3.40	0 - 15	1 - 15	-0.39		.59
Role-Boundary	6.69	4.44	0 - 15	0 - 15	0.36	- -	.78
Role-Insufficiency	10.84	2.65	0 - 15	5 - 15	-0.37	- -	.45
Role-Overload	12.73	2.62	0 - 15	5 - 15	-1.41	0.29	.56
Role-Responsibility	5.57	4.14	0 - 12#	0 - 12	0.09	- -	.83
Composite Scale#	46.86	10.45	0 - 75	27 - 68	0.08	- -	.75
Valence (Short)							
Role-Ambiguity	12.79	2.97	0 - 15	4 - 15	-1.29	-0.20	.71
Role-Boundary	10.56	3.79	0 - 15	1 - 15	-0.54	-0.15	.61
Role-Insufficiency	14.23	2.11	0 - 15	6 - 15	-2.94	-1.94	.91
Role-Overload	11.80	3.16	0 - 15	2 - 15	-1.12	0.40	.56
Role-Responsibility	7.74	4.41	0 - 15	0 - 15	-0.02	- -	.80
Composite Scale#	56.83	11.54	0 - 75	9 - 73	-1.60	0.02	.84
Strain							
Physical	22.13	12.08	0 - 60	0 - 50	0.22	- -	.87
Psychological	11.46	6.88	0 - 30	0 - 28	0.46	0.04	.84
Composite Strain#	28.46	15.32	0 - 90	0 - 65	0.30	- -	.90

Note: n = 77; # Composite Scale Formed From Sum of Sub-Scales; ## Tran/Var Skew - Variable Transformed to Reduce Skewness; #Scale Range - Variables Dropped to Improve the Reliability or Face Validity of the Scale.

With respect to the SD's for the scales, with the exception of the SD for the Valence Role-Insufficiency scale (2.11), the SD,s approximate the expected value from the observed range of responses.[B1] For example, the SD's for the strain scales all reflect the expected value from the range of responses. As such, the data for the strain scales may be seen as essentially normally distributed.

The observed range of responses for the Valence Role-Insufficiency scale is confined within the range 6-15 and corresponds to the extreme negative skewness coefficient of -2.94 for the scale. An examination of the frequency data for the six variables in the Role-Insufficiency scale (i.e., items 7 - 12 in valence questionnaire) provides some instructive insight to the basis for the high negative skew value. As indicated by the data, of the response alternatives (i.e., 3, 1, 0), on average 89% of the participants (i.e., 71 out of 80) expressed an over-whelming preference for the "mostly bad" (i.e., response 3) response option for the six variables in the Role-Insufficiency scale. For example, for the question "Feeling my university course will provide me with a good future is": 74 or 92.5% of the participants chose the "mostly bad" response option. In other words, the participants (i.e., first year students) are, it would seem, disappointed with their chosen course of study. In effect, the personal valence (i.e., attractiveness) of the course of study is essentially negative; seemingly it is unable or does not satisfy their needs for success and recognition. Furthermore, as evident from the wording or content of the question (and the other items in the scale) the frame of reference for the response is seemingly self-referrent in nature as the emphasis is placed on the use of "my" and "me" in the question. However, as suggested by the constriction in the range of responses and high negative skewness, correlations for this variable are likely to be deflated due to the constricted variability of the data (Tabachnick & Fidell, 1989).

[B1] From a relatively normal distribution, the expected value is derived from the formula: SD ≈ observed range/4 (Mendenhall & Ott, 1980, p. 64).

In terms of skewness, many of the variables reflect moderate positive or negative skew values either approaching or greater than the maximum value of 0.548 for skewness. That is, values greater than 0.548 reject the null hypothesis for normality. Therefore, variables with significant skewness were transformed using either square root, logarithm or reciprocal techniques in an attempt to achieve response distributions which approximate normality (Cohen & Cohen, 1983; Tabachnick & Fidell, 1989). As the table shows, of the transformed scales, the Valence Role-Insufficiency scale (skew - 1.94) is the only scale which does not fall within the limits for normality.

With the exception of the Physical Environment scale (α = -0.01), the Cronbach alpha coefficients for the OSI stressor scales are either low or moderate in nature. For example, the alpha coefficient of 0.58 for the Role-Overload scale indicates that errors in measurement account for 42.0% of the variance in this scale (Spector, 1994). By contrast, the strain scales all reflect high alpha coefficients for reliability. Conversely, because of low and negative reliability, the Physical Environment scale was dropped from the measurement model. Further, with the exception of the Expectancy Role-insufficiency (α = 0.45) and Valence Role-Insufficiency (α = 0.91) scales, the alpha coefficients for the OSI stressor (short), expectancy and valence scales are generally moderate in nature. The high alpha coefficient for the Valence Role-Insufficiency scale reflecting the high correlation between the variables in the scale due to the homogeneous nature (i.e., skew = -2.94) and moderate variability in the range of observed responses (i.e., 6-15) for this scale. Moreover, as indicted in the scale range data, due to the evidence of negative correlations in the reliability analyses (i.e., corrected item-total correlations), variables with negative correlations were removed from the respective scales as a means to increase the reliability of the scales.

B.1.2 Summary of Variability Statistics

A summary of the variability data for the OSI stressor (short), expectancy (short), valence (short) and comparative variability statistics from study No 1 are shown in Table B.2. The mean SD for the valence scales (4.66) is 0.04 higher than the mean SD for the expectancy scales (4.62) and 0.78 higher than the SD (3.88) for the OSI stressor (short) scales. Thus, when compared to the variability around the mean for the recognition (i.e., description) of stressors, the SD's imply that the involvement of individual differences in the personal meaning of stressors has a more pronounced effect on the variability in the response to sources of stress. Further, although not obvious from the table, the mean SD data for study one also indicates a similar distinction in the variability of the responses for the recognition and personal meaning of stressors. If the mean SD for the 10 item OSI stressor scales (8.52) is divided by a factor of four to (i.e., approximate the two item scales) the resultant SD of 2.13 is noticeably less that the mean SD for the expectancy (3.43) and valence (2.66) scales (see also Table B.1 - observed range of responses).

Table B.2
Variability and Comparison Statistics: Expectancy (Short), Valence (Short) and OSI Stressor (Short) Scales and Mean Summary Data From Study No 1

Stressor Dimension	Expectancy Scales			Valence Scales			OSI Stressor		
	SD	Skew	Alpha	SD	Skew	Alpha	SD	Skew	Alpha
Ambiguity	3.40	-0.39	.59	2.97	-1.29	.71	2.92	1.10	.68
Boundary	4.44	0.36	.78	3.79	-0.54	.61	2.60	0.88	.60
Insufficiency	2.65	-0.37	.45	2.11	-2.94	.91	3.10	0.59	.60
Overload	2.62	-1.41	.56	3.16	-1.12	.56	3.28	-0.12	.59
Responsibility	4.14	0.09	.83	4.41	-0.02	.80	2.46	1.17	.65
Composite	10.45	0.06	.75	11.54	-1.60	.84	8.91	0.41	.76
Mean Value	4.62	-0.28	.66	4.66	-1.25	.74	3.88	0.67	.66
Study No 1#	3.43	-0.42	.74	2.66	-0.51	.47	8.52	0.18	.77

Note: #Study No 1, Expectancy and Valence Scales - 2 Item Scales; Descriptive Scales - 10 Item Scales.

Furthermore, the negative and significant skew value (i.e., greater than 0.548) for the valence scales (-1.25) is -0.97 more negative than the mean negative skew value for the expectancy scales (-0.28) and -1.92 more negative than the mean skew value for the OSI stressor (short) scales (0.67). Thus, with the exception of the relatively normal distribution of the Role-Responsibility scales for expectancy (skew = 0.09) and valence (skew = -0.02), the responses for the expectancy and valence scales are in the main skewed toward the "mostly bad" and "very likely" (i.e., stressful poles) poles of the respective response scales. (Note: similar results were found in study one, although less extreme for the valence scales. The mean skew values for the expectancy and valence scales are likewise skewed in the negative direction).

The mean positive skew value for the descriptive scales (0.67) indicates that the frequency of the descriptive responses are significantly biased (i.e., skew value exceeds 0.548) toward the non-stressful pole (i.e., "rarely or never" or "sometimes") of the response scales. As a consequence, the variability of the scales is compressed and thus may provide a partial explanation for the low and generally moderate Alpha coefficients across the scales. That is, the constrictions in variability and the generally poor reliability coefficients may in effect reflect the effect of method variance or non-random contamination (i.e., reflect the nature of the items used in the scales and the associated response scales) as opposed to the effect of random errors in measurement (Spector & Brannick, 1995). It appears that participants found the OSI stressor, expectancy and valence items difficult to understand and thereby opted to randomise their response (i.e., guess) or report either a "normative" or perhaps "socially desirable" response to the item.

However, as evident from the skew data and the observed range of responses presented in Table B.1, several of the expectancy and valence scales reflect relatively normal distributions or a broad range of responses. For example, data for the expectancy and valence scales for Role-Responsibility show that (a) the scales are normally distributed and (b) participants used the range of the scale in their response to the scale items. Therefore, taken collectively, the response data indicates that the stimulus properties of the scales are psychometrically sound. Therefore, as in study one, it would appear that some form of intrinsic response bias in common to the participants has influenced or determined the overall negative skewness underlying the expectancy and valence scales (Williams & Clarke, 1997). As the data indicates, participants report a wide range of views on the effect of expectancy and valence role-responsibility stressors on their study, yet (a) view the expected effects of role-overload study demands as likely to cause them stress and (b) with the exception of responsibility demands, consider the valence (i.e., attractiveness) of study stressors as essentially bad or negative facets of study at university.

B.1.3 Graphical Summary of Study Demands Expectancy and Valence Stressors

Figures B.1 through B.5 display the raw data cumulative frequencies for the parallel Study Demands Expectancy and Valence scales prior to the removal of outliers and transformations (i.e., n = 79 cases). As shown by the graphs, the frequency of responses to the expectancy and valence Role-Ambiguity and Role-Overload scales converge toward the negative or stressful pole of the respective scales. Furthermore, they tend to track in unison and therefore likely to reflect as a significant positive correlation between the scales. In effect, the graphs appear to suggest that a common effect underlies the polarised responses to the items in the ambiguity and overload scales. Therefore, it may be the case that either the contextual norm or the social norm for the items

(a) has a common effect on the response to the items in the scales and (b) tends to overrule the self-referrent or personal meaning attributed to these facets of study (Ajzen & Fishbein, 1980; Hesketh & Gardner, 1993). Alternatively, it may also be the case that the participants were unable to make the cognitive distinction (i.e., discriminate) between the expectancy and valence items in the ambiguity and overload scales. As a result, they opt to report either the *expected response* or the *social norm* for the items.

The cumulative responses for the parallel Role-Boundary and Role-Insufficiency scales primarily accumulate around opposite poles of the respective scales. Moreover, although the responses to the valence items are seemingly a reflection of the social norm for the items in the respective scales, they imply that the participants were able to discriminate between the social norm for the valence items and the personal meaning attributed to the stimulus attributes of the expectancy items. In particular, the cumulative responses for the valence of role-insufficiency predominantly converge around the "mostly bad" pole of the scale, yet in spite of this bias, the participants are still able to provide a near normal (skew = 0.117) distribution of responses to the stimulus items in the Role-Expectancy scale.

For the expectancy and valence Role-Responsibility scales, however, the cumulative responses are essentially normally distributed. As Figure B.5 indicates, the distribution for the expectancy scale is basically trimodel in nature and the valence scale, clearly bimodal in nature. The distributions suggest that the respondents hold concrete valence and expectancy views about the nature and possible effect of responsibility at university. Furthermore, they provide some insight to the role of individual differences in the nature of personal meaning assigned to a common sources of stress. For instance, the trimodel distribution for the expectancy scale indicates that approximately 22.0% of the participants believe that responsibility will not cause them stress; 35.0% that responsi-

bility may sometimes cause them stress; and 42.0% that responsibility will most likely cause them stress. On the other hand, the bimodel distribution for the valence scale indicates that respondents hold relatively discrete views concerning the valence of responsibility. Approximately 50.0% of participants hold the view that responsibility is a "mostly good" or desired facet of study; and the other 50.0% that responsibility for their study is "mostly bad" or an undesirable facet of tertiary studies.

The expectancy and valence data suggest that there may be two relatively independent populations with conflicting social norms regarding the acceptance and possible effects of responsibility (Hulan & Blood, 1968). Furthermore, whilst earlier research (Ajzen & Fishbein, 1980, Vroom, 1964) indicates that the expectancy and valence constructs are closely related, the graphs suggest that these constructs of personal meaning are somewhat more independent in nature. Therefore, they may be expected to function as independent predictors of strain related outcomes. However, the overall negative skewness of the valence data and the resultant constrictions in variability may result in these scales not correlating significantly with measures of strain and hence their ability to function as independent predictors of strain.

B.2 Strain Scale Evaluations (Descriptive Sample)

The ability of the Physical, Psychological and Composite Strain scales to capture or account for the nature of the transactional relationship between common and personal meaning sources of stress and symptoms of strain is shown in Table B.3. As the table illustrates, the cumulative effect from the original OSI common stressor scales explains 32.22% (adj) of the variance in Composite Strain and the cumulative effect from the

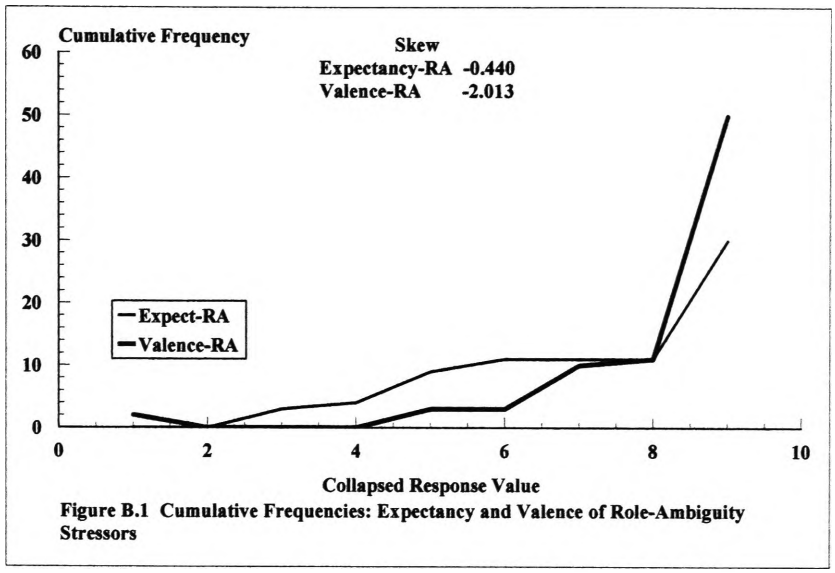


Figure B.1 Cumulative Frequencies: Expectancy and Valence of Role-Ambiguity Stressors

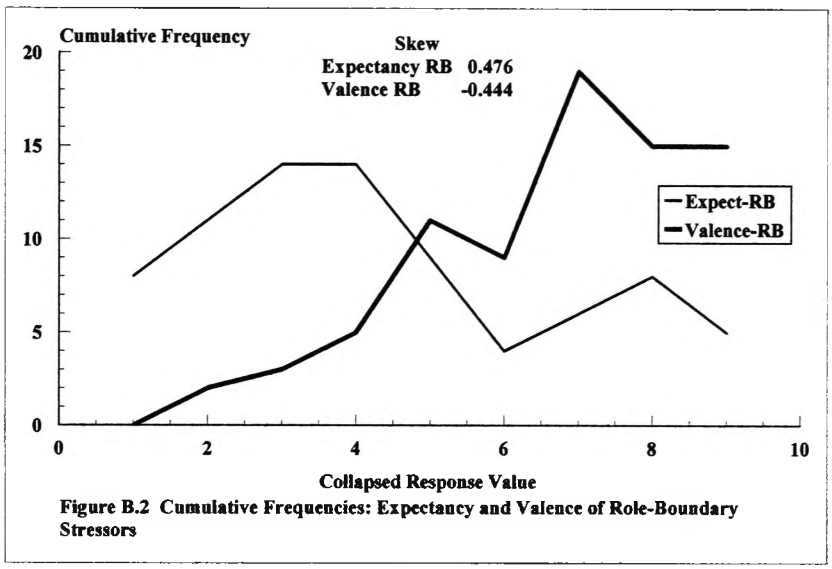


Figure B.2 Cumulative Frequencies: Expectancy and Valence of Role-Boundary Stressors

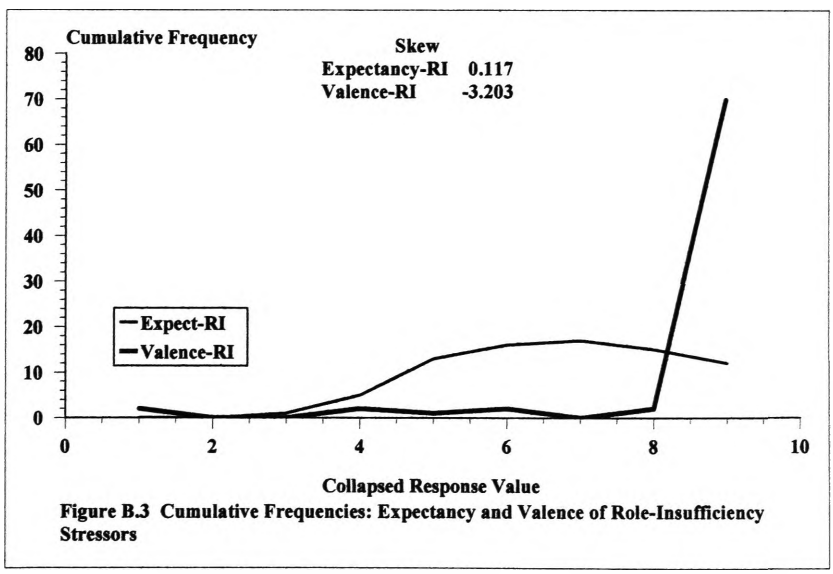


Figure B.3 Cumulative Frequencies: Expectancy and Valence of Role-Insufficiency Stressors

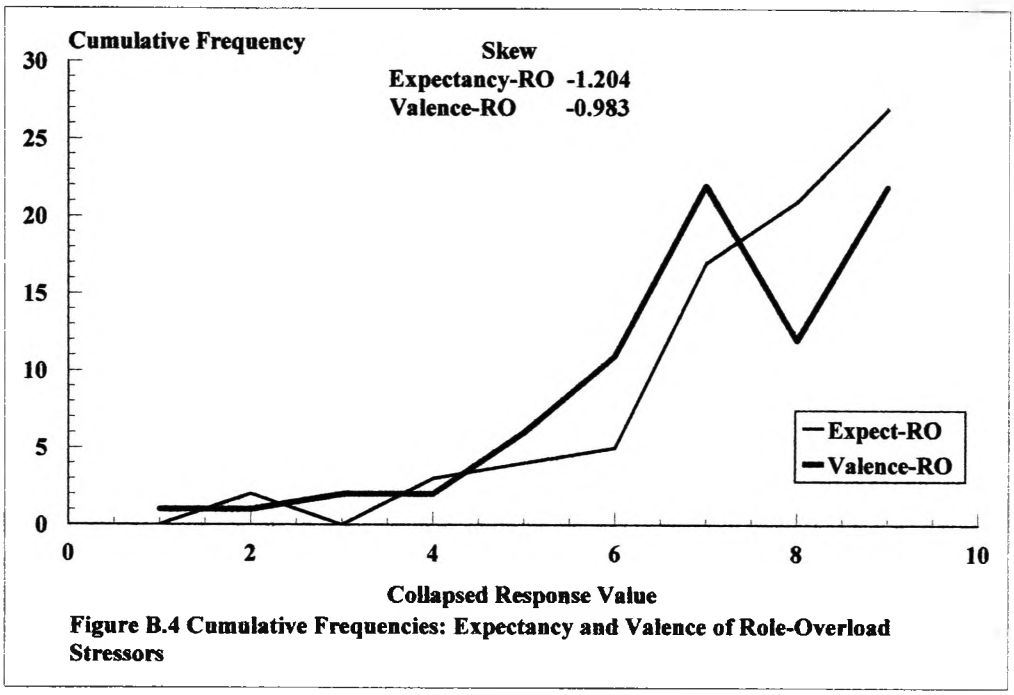


Figure B.4 Cumulative Frequencies: Expectancy and Valence of Role-Overload Stressors

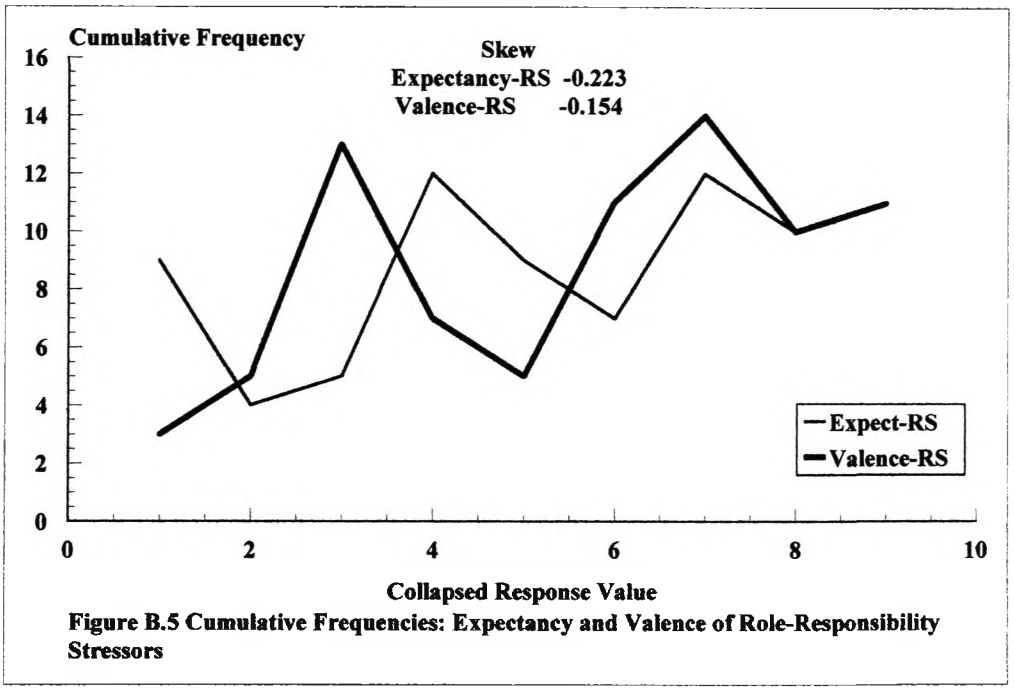


Figure B.5 Cumulative Frequencies: Expectancy and Valence of Role-Responsibility Stressors

OSI transformed scales model, 31.34% (adj) of the variance in the Composite Strain scale. By contrast, the OSI models explain respectively, a slightly lower 30.89% (adj) and 30.01% (adj) of the variance in Physical Strain; a reduced 25.34% (adj) and 24.71% (adj) of the variance in Psychological Strain; and a slightly higher 25.55% (adj) and 25.46% (adj) of the variance in the transformed Psychological Strain scale. In contrast, the cumulative effect of the OSI/Expectancy/Valence Short scales, explain on average, 21.13% of the variance in physical, psychological and composite symptoms of strain.

Taken at face value, it would seem that the Physical Strain and Composite Strain scales are roughly equal in their ability to capture the effects of stressors; and the Psychological Strain scale somewhat inferior. However, when the results for the OSI stressor (transformed scales) model are considered in proportional terms, the 20 item physical scale explains on average 1.50% of the variance per item, the 10 item psychological scale 2.47% per item, the 10 item transformed psychological scale 2.55% per item and the composite scale 1.21% of the variance per item. Accordingly, in terms of efficiency the psychological scales provide the most parsimonious approach to the measurement of strain. When seen in terms of conceptual understanding (i.e., encompass the dimensions of strain), however, the Composite Strain scale provides the more valid approach by which to capture the translation of stressor effects to symptoms of strain. Similarly, although somewhat different due to the sampling effect of the five item scales on interscale correlations, the results for the short scale model indicate that the Composite Strain scale captures more of the variance in strain from the effect of descriptive and personal meaning stressors.

Table B.3
Strain Scale Evaluations: Physical, Psychological and Composite Strain Scales

Strain Scales	Role-Stressor Models (Backward Analyses)					
	OSI Stressor Scales		OSI Stressor (Transformed Scales)		OSI Stressor, Expectancy & Valence Scales (Short Form)	
	Final Model+	Rsqr (Adj)	Final Model+	Rsqr (Adj)	Final Model+	Rsqr (Adj)
Physical (20 Items)	R-Ambiguity R-Responsib R-Overload	30.89%	R-Ambiguity# R-Responsib# R-Overload	30.01%	R-Boundary# Expect R-Ambiguity#	21.92%
Psychological (10 Items)	R-Overload R-Ambiguity R-Responsib	25.34%	R-Overload R-Ambiguity# R-Responsib#	24.71%	R-Boundary# R-Overload Expect R-Ambiguity##	19.54%
Psychological# (10 Items)	R-Overload R-Ambiguity R-Responsib	25.55%	R-Overload R-Ambiguity# R-Responsib#	25.46%	R-Boundary# R-Overload Expect R-Ambiguity#	20.84%
Composite Strain (26 Items)	R-Ambiguity R-Responsib R-Overload	32.22%	R-Responsib# R-Ambiguity# R-Overload	31.34%	R-Boundary# Expect R-Ambiguity#	22.21%

Note: 1) +Variables in Final Equation: (a) Prob of t Value ≤ 0.05, ## ≤ 0.0554; (b) #Transformed Variable; (c) Shown in Order of Significance; 2) Variables in the Model: (a) OSI Stressor Model - Five OSI Stressor Scales; (b) OSI Stressor (Transformed) Model - Two OSI Stressor and Three Transformed OSI Stressor Scales; (c) OSI Stressor, Expectancy and Valence Model (Short Form Scales) - Four Significant Predictors Identified in Baseline Analyses Using Transformed Variables (See Table 3.2.2.5).

B.3 Results: Personal Meaning Sample

B.3.1 Descriptive Statistics

Descriptive statistics (n = 72) for the scales used in the analyses are shown in Table B.4. With the exception of the mean scores for the Role-Responsibility and Physical Environment scales, there is a wide variability the mean scores for the expectancy and valence scales. In particular, the mean scores for the valence Ambiguity, Boundary and Insufficiency scales are respectively 4.36, 6.71 and 7.66 higher than the parallel expectancy scale; conversely, the mean score for the Expectancy Overload scale is 6.26

higher than the Valence Overload scale. In addition, the mean for the Composite Valence scale (i.e., 99.63) is 14.32 higher than the mean score for the Composite Expectancy scale (i.e., 85.31).

With one exception, the SD's for the valence and expectancy scales tend to approximate those expected from the observed range of responses for the respective scales. Similarly, the SD's for the strain scales reflect the expected values from the distribution of the observed data. In contrast, the SD for the Composite Valence scale (i.e., 11.778) is 5.811 less than the SD for the Composite Expectancy scale (i.e., 17.589). A statistical comparison of the SD's confirmed the difference between the SD's as significantly different.[B2] In addition, the observed range of responses for the Composite Expectancy scale (i.e., 76) is higher than the observed range of responses for the Composite Valence scale (i.e., 65); and furthermore, although within the limits for a normal distribution, the skewness coefficient for the valence scale (i.e., -0.366) is somewhat more negative than the coefficient for the expectancy scale (i.e., -0.270). The generally higher mean scores for the valence scales reflects the constricted range of responses and higher negative skewness for the valence scales. Thus, there is a distinct slippage between the response distributions for the expectancy and valence scales. This suggests that participants (a) hold concrete views on the personal meaning assigned to common stressors; (b) are able to discriminate the nature of expectancy and valence sources of stress; and (c) that the scales are psychometrically sound (i.e., both the range of the observed responses and the skew coefficients for normality vary across the scales).

[B2] Based on the assumption that the Composite Expectancy and Valence scales represent independent populations and using the formula: $F = S^2 1/S^2 2$ at α 0.01 (Two-Tailed) for df n1-1 and n2-1, it is possible to test the difference between the SD's (Mendenhall & Ott, 1980, p. 307). Conversion of the SD's to S results in F = 2.23 which is $\geq$ than Fcrit = 1.74 at α 0.01 for df n1 = 75 and n2 = 70.

Table B.4
Descriptive Statistics - Expectancy and Valence Scales

Scale	Mean	SD	Scale Range#	Observed Range	Skew	Tran/Var Skew##	Cron Alpha
Expectancy							
Role-Ambiguity	21.24	5.114	0 - 30	9 - 28	-0.524	0.221	.6135
Role-Boundary	10.03	5.531	0 - 27#	0 - 20	-0.152	----	.7627
Role-Insufficiency	16.06	3.767	0 - 30	7 - 27	0.255	----	.4389
Role-Overload	20.79	3.779	0 - 27#	9 - 27	-1.248	0.010	.5534
Role-Responsibility	17.19	7.206	0 - 30	1 - 28	-0.440	----	.8031
Physical Environment	4.61	1.579	0 - 6	0 - 6	-0.960	----	-.0160
Composite Scale+	85.31	17.589	0 - 144#	44 - 120	-0.297	----	.8503
Valence							
Role-Ambiguity	25.60	5.142	0 - 30	7 - 30	-1.589	0.221	.7881
Role-Boundary	16.74	4.035	0 - 27#	6 - 27	0.071	----	.5109
Role-Insufficiency	23.72	2.810	0 - 27#	15 - 27	-1.177	0.204	.5531
Role-Overload	14.53	3.654	0 - 27#	5 - 21	-0.373	----	.4156
Role-Responsibility	19.15	4.650	0 - 30	10 - 30	0.186	----	.5807
Physical Environment	4.76	1.835	0 - 6	0 - 6	-1.273	----	.5454
Composite Scale+	99.63	11.778	0 - 141#	64 - 129	-0.366	----	.7225
Strain							
Physical	22.00	10.713	0 - 60	3 - 46	0.331	----	.8306
Psychological	11.36	7.514	0 - 30	0 - 27	0.442	----	.8736
Composite Strain+	28.38	14.23	0 - 78#	3 - 59	0.414	----	.8756

Note: n = 72; + Composite Scale Formed From Sum of Sub-Scales; ##Tran/Var Skew - Variable Transformed to Reduce Skewness; Scale Range# - Variables Dropped to Improve the Face Validity of the Scale, Reliability of the Scale or Maintain Equivalence Between the Scales.

With the exception of the expectancy Ambiguity (i.e., -0.524) and Overload (i.e., -1.248) scales, and the valence Ambiguity (i.e., -1.589) and Insufficiency (i.e., -1.177) scales, the skew coefficients for the expectancy, valence and strain scales all lie within the limits for normality (i.e., 0.566). As shown in Table B.4, the scales with abnormal negative skewness were transformed to approximate normal distributions. Furthermore, the skew coefficients for the scales with abnormal skewness essentially correspond to those for the respective five item expectancy and valence scales used in the descriptive questionnaire (see Table B.1). For example, the skew value of -1.589 for the Valence Role-Ambiguity scale compares with the skew value of -1.29 obtained from

the responses to Valence Role-Ambiguity scale by the descriptive sample. There is, it appears, some underlying factor in common with the response to the scale items that influence the negative direction (i.e., "mostly bad" or "very likely to cause me stress") and intensity of the response to the items. Perhaps, the scales do not provide or induce self-referrent responses but rather may reflect the social or contextual norm for the item.

However, it may also be the case that the scales do actually measure sources of personal stress which are relevant to the sample. The participants are all first year students and may not have fully adjusted to the demands of study at university. As Payne et al. (1988) likewise concluded, of the 43 items used to measure the frequency and satisfaction with job demands, 16 were more frequently seen as a source of job dissatisfaction. Furthermore, the magnitude of the inverse correlations varied between -0.33 and -0.69. Therefore, with respect to the negative direction of the responses for present study, it is possible that the personal meaning attributed to a common source of stress may well vary around a mean that falls toward the negative or stressful pole of the response distribution.

With the exception of the alpha coefficient for Expectancy Physical Environment scale, the Cronbach alpha coefficients for the expectancy scales vary from a low α = 0.4389 for the Role-Insufficiency scale to moderate α = 0.8031 for the Role-Responsibility scale. The rather poor alpha coefficient for the insufficiency scale indicating that errors in measurement (i.e., random and non-random) account for 56.0% of the variance in the responses for this scale (Spector & Brannick, 1995). In addition, it indicates that the maximum possible validity for the scale is reduced to 0.6625 (Spector, 1994). The Cronbach alpha coefficient of -0.0160 for the two item Expectancy Physical

Environment scale, however, is extremely poor. As a result, this scale and the commensurate Valence Physical Environment scale (i.e., due necessity to maintain equivalence across the models) were dropped from subsequent analyses.

For the valence scales, however, with the exception of the Role-Ambiguity scale the Cronbach alpha coefficients are generally below acceptable minimum limits for internal consistency (Cox & Ferguson, 1994). They range from a low $\alpha = 0.4156$ for the Role-Overload scale to a maximum of $\alpha = 0.7881$ for the Role-Ambiguity scale. The poor coefficients reflecting the constriction in the range of responses for these scales. For example, the alpha coefficient for the Role-Overload scale (0.4156) indicates that errors associated with the measurement of overload valencies account for 58.0% of the variance in the response to this scale. Moreover, it indicates that the maximum possible validity for the scale is reduced to a low 0.6447.

The Cronbach alpha coefficients for the strain scales are all reasonably high. They range from $\alpha = 0.8306$ for the 20 item Physical strain scale, to a maximum of $\alpha = 0.8756$ for the 26 item Composite Strain scale. Furthermore, the alpha coefficients correspond to those for the descriptive sample (see Table B.1). Finally, as indicated in the scale range data, items with negative corrected item-total correlations were removed from scales as a means to increase the internal consistency of the scale (Norusis., 1988b).

B.3.2 Summary of Variability Statistics

A summary of the variability data for (a) the 10 item expectancy and valence scales, (b) the 10 item OSI stressor scales used by the descriptive sample, and (c) comparative mean variability statistics from the descriptive sample and Study No 1 are presented in Table B.5. The mean SD for the valence scales (i.e., 5.35) is 1.82 lower the mean SD for the expectancy scales (i.e., 7.17) and 0.31 lower than the SD for the OSI stressor

scales (i.e., 5.66). The lower mean SD for the valence scales is in effect a reflection of constrictions in the raw data (see Table B.4) and the higher negative skew coefficient (i.e., mean -0.54) for the valence scales.

Furthermore, similar to the differences between the mean SD's for the short form scales (see Table B.2.), the mean SD for the expectancy scales and the SD's for the valence Ambiguity, Boundary and Responsibility scales are higher than those for the OSI descriptive scales. In particular, the mean SD for the expectancy scales is significantly different at $\alpha \leq 0.05$ from the mean SD for the OSI scales.[B3] Therefore, similar to the descriptive sample and the results from Study 1 (see Appendix A.1.3), when compared to the variability in the recognition of stressors, the effect of individual differences related to the expectancy and valence of stressors is seemingly the more sensitive or has the more influential effect on the variability in the personal response to sources of stress at university.

The mean skew values for the expectancy (i.e., -0.40) and valence (i.e., -0.54) scales are on average normally distributed (i.e., ≤ 0.566) and the OSI scales on average, significantly skewed (skew = 0.61) in the positive direction. Therefore, on average, there is a 1.08 difference between the mean skew coefficients for the scales. That is, when converted to SE's of skew (i.e., 1.08/0.566 = 1.908 SE's of skew or Z = 1.908) and tested for significance against Z at α 0.05 (One Tailed), there is significant a difference (i.e., prob of Z = 0.0281) between the mean skew values.[B4] In other words, the data indicates that (a) the participants are able to effectively discriminate the recognition and

---

[B3] Refer footnote B2 - For F = 1.61 ≥ Fcrit 1.47 at α 0.05 for df n1 = 75 and n2 = 70, the difference between the independent samples is significant.

[B4] Note: The SE for skewness is a function of N and thereby common to each distribution. It is calculated using the formula Ss = $\sqrt{6/N}$ (Tabachnick & Fidell, 1989, p. 72).

personal meaning of stressors, (b) hold both concrete and polarised views on the objective nature and personal meaning attributed to stressors and (c) the recognition and personal meaning of stressors are relatively discrete cognitive processes.

Table B.5
Variability and Comparison Statistics: Expectancy, Valence and OSI Stressor Scales and Mean Summary Data From Study No 1

Stressor Dimension	Expectancy Scales			Valence Scales			OSI Stressor Scales		
	SD	Skew	Alpha	SD	Skew	Alpha	SD	Skew	Alpha
Ambiguity	5.11	-0.52	.61	5.14	-1.59	.79	5.02	0.97	.78
Boundary	5.53	-0.15	.76	4.04	0.07	.51	3.82	0.67	.58
Insufficiency	3.77	0.26	.44	2.81	-1.18	.55	3.85	0.32	.60
Overload	3.78	-1.25	.55	3.65	-0.37	.42	4.30	0.26	.58
Responsibility	7.21	-0.44	.80	4.65	0.19	.58	3.20	0.84	.57
Composite	17.59	-0.30	.85	11.78	-0.37	.72	13.77	0.62	.83
Mean Value	7.17	-0.40	.67	5.35	-0.54	.60	5.66	0.61	.66
Descriptive#	4.62	-0.28	.66	4.66	-1.25	.74	3.88	0.67	.66
Study No 1+	3.43	-0.42	.74	2.66	-0.51	.47	8.52	0.18	.77

***Note:** Descriptive# - Five Item Expectancy (Short), Valence (Short) and OSI Stressor (Short) Scales; Study No 1+ - Expectancy and Valence Scales - 2 Item Scales; Descriptive Scales - 10 Item Scales

Further, with the exception of the Expectancy Role-Insufficiency scale and the Valence Role-Boundary and Role-Responsibility scales, the responses for the personal meaning attributed to stressors tend to cumulate toward the stressful poles of the respective scales (i.e., "very likely" and "mostly bad"). Conversely, those for the OSI descriptive scales tend to gather toward the non-stressful pole (i.e., "sometimes" or "rarely or never") of the response scale. Consequently, the variability in the response to the descriptive items is generally compressed within a more narrow range (e.g., Composite OSI scale, see Table B.1: observed range of responses 14 - 79 from possible range

0 - 138) and may partly account for the generally poor reliability of the OSI stressor scales. Furthermore, as shown in the table, the direction of the skew coefficients are consistent across the three samples. Those for the valence scales on average more negative than the expectancy scales; and those for the OSI stressor scales consistently positive in nature.

However, the data for the personal meaning and recognition scales suggests that poor reliability is not necessarily related to the skewness of the scale. For example, the response to the Expectancy Role-Insufficiency scale is normally distributed (i.e., 0.26) yet still achieves a poor internal consistency (i.e., $\alpha = 0.44$) between the items in the scale. Similarly, even though normally distributed, the Valence Role-Overload and OSI Role-Overload scales both reflect poor alpha coefficients. Therefore, it would seem the underlying effect of method variance contamination has undermined the consistency of the participants responses to the stimulus items in the scales. Perhaps the items in the scales with poor reliability were difficult to understand. For example, the insufficiency item "Feeling that my coursework fits my abilities and interests will cause me stress" required participants to readjust their *mindset* toward the item and think carefully about their response to the anchors used in the scale.

Nonetheless, regardless of the apparent trends in the distribution of the data, several of the expectancy and valence scales reflect normal distributions and a broad range of responses to the items in the respective scales. For instance, the responsibility scales are both normally distributed and reflect a wide variability in the scores for the scales. As the data indicates, participants reported a wide range of views on the expected effect of (a) responsibility and insufficiency stressors and (b) the valence of responsibility, boundary and overload stressors on their study. Yet on the other hand, they single out expectancy overload stressors as most likely to cause them stress; and the valence of

insufficiency and ambiguity study stressors as essentially bad or negative facets of study at university. On this basis, therefore, there is evidence to suggest that the stimulus properties of the scales are in the main psychometrically sound. Therefore, similar to the findings from study 1 and the descriptive sample, it appears that that some underlying bias in common with the samples determines (a) the consistency in the negative skewness of the personal meaning attributed to stressors, (b) the positive skewness of descriptive information about common stressors and (c) the significant difference between the mean skew coefficients for the personal meaning and descriptive scales (see footnote B.4: the difference between the average skew values for the descriptive sample and study 1 are likewise significant).

B.3.3 Graphical Summary of Study Demands Expectancy and Valence Stressors

Figures B.6 through B.10 illustrate the distribution of the raw data cumulative frequencies for the parallel expectancy and valence scales prior to the removal of outliers from the data set and transformations of the raw data (i.e., n = 73 cases). As the graphs show, the expectancy and valence ambiguity scales are clearly skewed in the negative or stressful direction (i.e., high response values for "very likely to cause stress" and "mostly bad") and tend to replicate each other or track in unison over the range of the scale. As such, the correlation between these scales is likely to be high. Similarly, the expectancy and valence overload scales are skewed in the negative direction. However, in contrast to the ambiguity scales, the expectancy scale is significantly skewed toward the negative pole of the scale (i.e., -1.147) and the valence scale is in essence normally distributed (i.e., -0.367). That is, although the majority of participants expect overload demands in their studies to cause them stress, they do not necessarily consider the valence of over-load stressors to be a negative facet (i.e., "mostly bad") of study at university. Moreover, with the exception of the sharp reversal at the highest response values

(i.e., 13 and 14), the profiles for the overload scales tend to track in unison and thereby are likely to reflect a significant correlation. Therefore, on the one hand, the skewed distributions suggest that a common effect by and large determines the personal meaning attributed to both the ambiguity scales and the valence overload scale; yet, on the other, that individual differences determine the personal valence of overload stressors. In other words, the graphs imply that the expected effect of an overload stressor does not necessarily dictate the personal valence of a stressor. In effect, if the sample is split at the response value 11, there are perhaps two distinct views on the personal meaning of stressors. Those with values at or below 11 (i.e., on average 47.0% of the respondents) indicating that increasing expectancy overload demands translate to an in crease in the negative valence (i.e., decrease in the attractiveness) of overload demands; and those beyond 11, that for a large number of participants (i.e., on average 53.0%) increases in the expected effects of overload stressors may actually reflect as a decrease in the negative valence of a stressor. That is, for this latter group, it seems that stressful coursework demands are seen as either appealing or a source of challenge.

The graphs for the role-boundary scales are basically normally distributed. Furthermore they tend to rise in sympathy up to the response value 10 and thereafter show a reversal in direction. As indicated by the graphs, from the response value 12, only 9 (i.e., 12.0%) of the participants reported that the valence of boundary demands were mostly bad; and a much higher 22 of the participants (i.e., 30.0%) that the expectancy of boundary demands would cause them stress. Again, there is the inference that high expectancies of stress do not necessarily reflect as an increase in the negative valence of stressors.

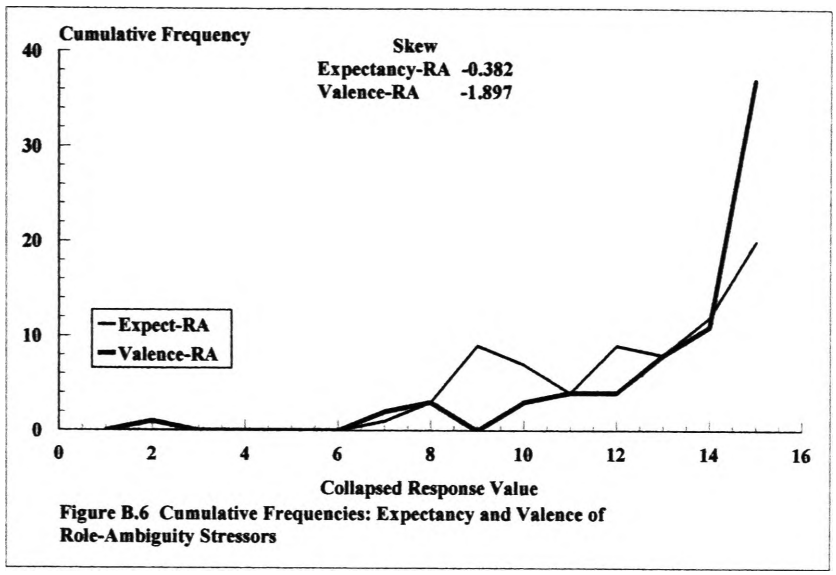


Figure B.6 Cumulative Frequencies: Expectancy and Valence of Role-Ambiguity Stressors

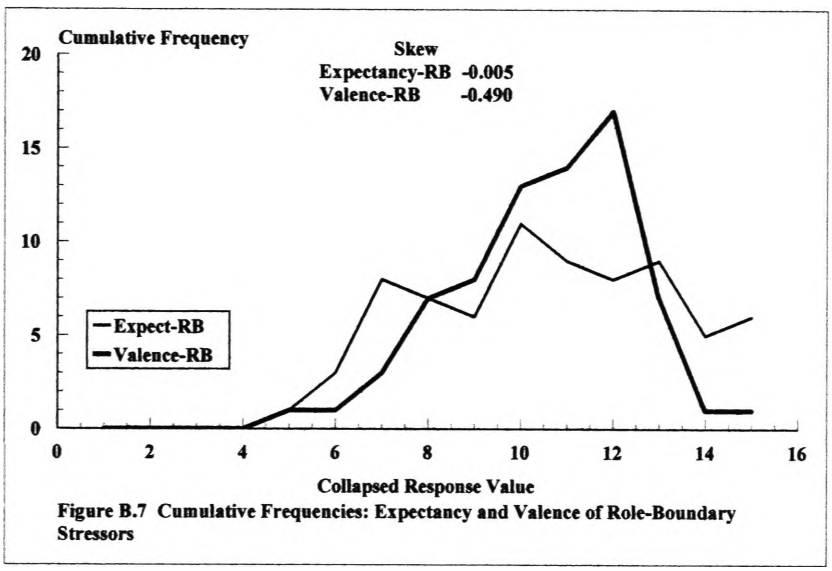


Figure B.7 Cumulative Frequencies: Expectancy and Valence of Role-Boundary Stressors

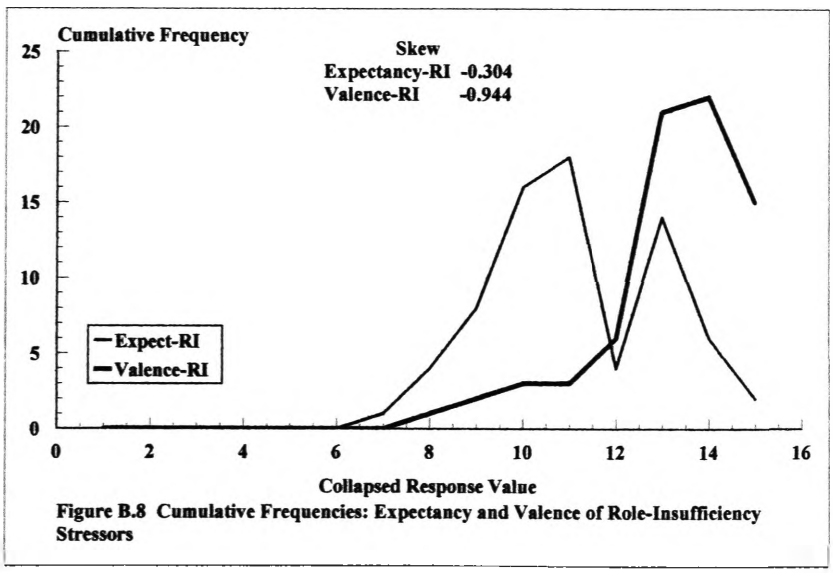


Figure B.8 Cumulative Frequencies: Expectancy and Valence of Role-Insufficiency Stressors

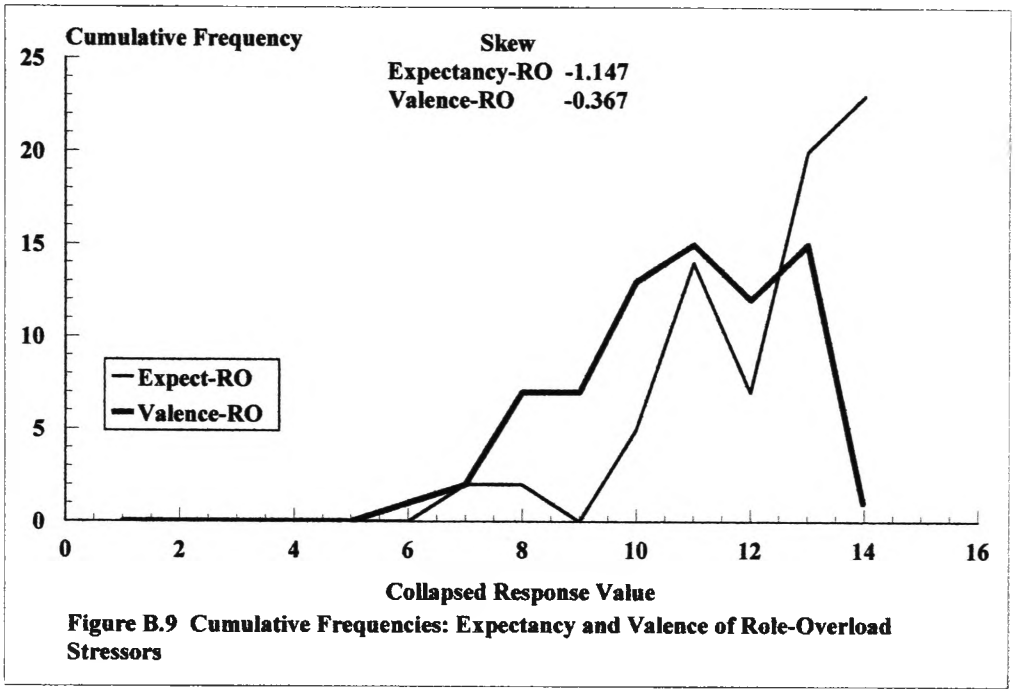


Figure B.9 Cumulative Frequencies: Expectancy and Valence of Role-Overload Stressors

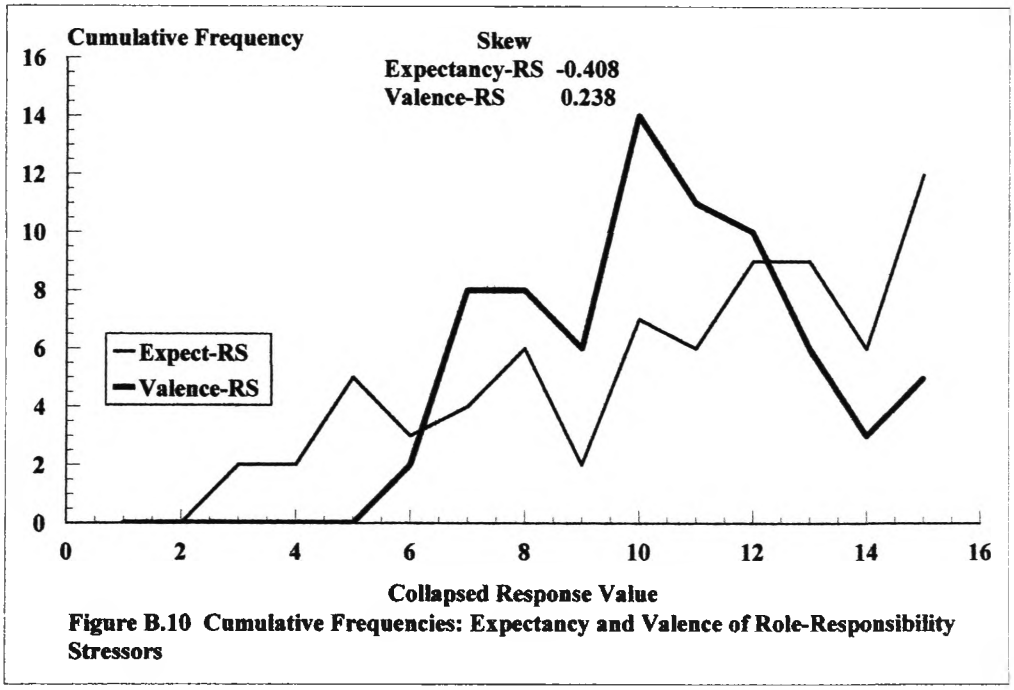


Figure B.10 Cumulative Frequencies: Expectancy and Valence of Role-Responsibility Stressors

The distribution of the cumulative frequencies for the Expectancy Role-Insufficiency scale, although normally distributed (i.e., -0.382), is however, clearly bimodal in nature; conversely, the distribution for the valence scale is significantly skewed from normal in the negative direction (i.e., -0.944). However, if the data is split at response value 12, there are seemingly two groupings of personal meaning attributed to the expectancy and valence scales. Those at or below 12 suggesting that low to medium levels of expectancy demands from insufficiency stressors translate to a decrease in the negative valence of insufficiency stressors associated with the students course of study. That is, even though a course of study may impose high but reasonable demands, it is seeming logical to conclude that a course of study which satisfies one's personal needs and expectations will be highly attractive to enrolled students. Conversely, for those above 12, the expectancy of high levels of stress from insufficiency sources of stress (e.g., feeling the course does not satisfy their intrinsic needs) seemingly translates to a sharp increase in the negativity of the personal valence of insufficiency stressors associated with study at university.

With respect to the role-responsibility scales, the cumulative frequencies for the expectancy and valence scales are normally distributed (i.e., -0.408 and -0.238). Further, the graphs suggest (a) that expectancies associated with responsibility demands may reflect as an increase in the negative valence of responsibility demands and (b) a reversal in the relationship between expectancy and valence in the tails of the distribution. In short, the distribution indicates that three categories of individual differences underpin the personal meaning assigned to responsibility stressors and the correspondence between expectancy and valence responsibility stressors. Participants in the first category falling within the response values 2 and 6; the second, within the response values 6 and 12; and the third, within the response values 12 to 15.

For those in the first category, there is the inference of a preference for an inverse relationship between expectancy and valence. That is, the data implies that the awareness of low expectancy demands (i.e., unlikely to cause stress) elevates the attractiveness of responsibility for this group of participants. For those in the second category, the expected effect of responsibility demands reflects an increasing or positive relationship with the negative valence of responsibility stressors. Seemingly, for this group of participants, the awareness of increasing expectancy demands translates to an increase in the negative valence of responsibility stressors. Whereas for the third category, the graphs imply that the existence of high expectancy demands correspond to a reduction in the negative valence of responsibility stressors. In other words, for this group of participants, responsibility demands are seemingly seen as either a personal challenge or an attractive facet of study at university (see also results for study one: Appendix A.1.3).

Taken overall, the graphs indicate degrees of slippage (i.e., expectancy tends to lead valence), independence (i.e. the graphs do not track in unison) and separation (i.e., magnitude) of the responses to the expectancy and valence scales. Further, although there is assumed to be a fusion or functional linkage of expectancy and valence cognitive processes, the graphs tend to indicate that these constructs of personal meaning are to some extent independent in nature. There is, however, graphical evidence that implies a functional relationship between the expectancy and valence processes serves to underpin the resultant personal meaning attributed to sources of stress. Thus, the expectancy and valence stressor dimensions would be expected to function as independent predictors of strain related outcomes. However, due to the effect of the overall skewness and often bimodal nature of the response distributions, the expectancy and valence scales may not reflect significant correlations with measures of strain

B.4 Strain Scale Evaluations: Descriptive and Personal Meaning Samples

The ability of Physical, Psychological and Composite Strain scales to capture or account for the effect of commensurate OSI descriptive, expectancy and valence sources of stress is summarised in Table B.6. In addition, the results from the composite short form model is included in the table for comparative purposes. As the table shows, the 26 item Composite Strain scale explains 31.34% (adj) of the variance when used with the OSI stressor scales and a lower 14.82% (adj) when used with the expectancy stressors; the 20 item Physical Strain scale a slightly lower 30.01% (adj) and 12.98% (adj) of the variance; and the 10 item Psychological Strain scale, a reduced 24.71% and 9.53% of the variance in strain. By contrast, the results for the valence stressors show no significant effect on dimensions of strain.

If taken on face value, the Composite Strain scale is seemingly the more effective measure of strain. However, when the effect of the OSI stressor and expectancy stressors on strain is considered in proportional terms, the efficiency of the strain scales becomes more clear. Specifically, the 20 item Physical Strain scale explains 1.50% of the variance per item from the effect of the OSI stressors and a much lower 0.65% of the variance per item from the effect of the expectancy scales; the 10 item Psychological Strain scale a substantially higher 2.47% and 0.95% of the variance per item; and the 26 item Composite Strain scale, a reduced 1.21% and 0.57% of the variance per item. Therefore, when compared in terms of efficiency, the Psychological Strain scale provides the most parsimonious method by which to capture and explain the translative effect of common and personal stressors. However, when seen in terms of conceptual understanding, the Composite Strain scale, although not the most efficient, provides the more valid approach to the measurement of strain related symptoms and insight to the negative effects of common and personal stressors on study at university.

Table B.6
Strain Scale Evaluations: Descriptive and Personal Meaning Samples - Physical, Psychological and Composite Strain Scales

Strain Scales	Role Stressor Models							
	OSI Stressor (Transformed Scales)		Expectancy (Transformed Scales)		Valence (Transformed Scales)		Short Form Scales: Significant OSI Stressor, Expectancy and Valence Scales	
	Final Model*	Rsqr (Adj)	Final model*	Rsqr (Adj)	Final Model**	Rsqr (Adj)	Final Model*	Rsqr (Adj)
Physical	R-Ambig# R-Respons# R-Overload	30.01%	R-Overload# R-Boundary	12.98%	Nil Significant	----	R-Boundary# Exp R-Ambig	21.92%
Psychological	R-Overload R-Ambig# R-Respons#	24.71%	R-Insuffic	9.53%	R-Ambig#	2.89%	R-Boundary# R-Overload Exp R-Ambig##	19.54%
Composite Strain	R-Respons# R-Ambig# R-Overload	31.34%	R-Boundary R-Overload#	14.82%	Nil Significant	----	R-Boundary# Exp R-Ambig	22.21%

Note: 1) Variables in Final Equation: (a) Prob of t Value * ≤ 0.05, ** ≤ 0.10; (b) ## Significance in Model, p 0.0554; (c) Shown in Order of Significance; (d) # Transformed Variable. 2) Variables in the Model: (a) OSI Stressor, Expectancy and Valence Transformed Models - i) Five Stressor Scales, ii) Skewed Scales Replaced With Transformed Scales; (b) Short Form Scales: OSI Stressor, Expectancy and Valence Model - Four Significant Predictors Identified in Baseline Analyses Using Transformed Scales (See Table 3.2.2.5).

Appendix B.5

Stress at University Survey (Descriptive Questionnaire)

UNIVERSITY OF WOLLONGONG: DEPARTMENT OF PSYCHOLOGY

Stress at University Survey

CONSENT FORM

WELCOME TO THE STRESS AT UNIVERSITY SURVEY. MY NAME IS PENG LIU AND I AM A PASS MASTER STUDENT FROM THE DEPARTMENT OF PSYCHOLOGY AT THIS UNIVERSITY. I AM ASSISTED IN THIS RESEARCH BY TOM ABSON A PhD STUDENT IN THE DEPARTMENT OF PSYCHOLOGY. I WOULD LIKE YOUR HELP TO GATHER INFORMATION CONCERNING THE NATURE OF STRESS ASSOCIATED WITH YOUR STUDIES AT THIS UNIVERSITY.

MY OBJECTIVE IS TO IDENTIFY THE AREAS OF STRESS AT UNIVERSITY WHICH YOU BELIEVE ARE OF CONCERN TO YOU AND THE RELATIONSHIP OF THESE CONCERNS WITH YOUR CURRENT FEELING OF WELL-BEING.

THE RESULTS OF MY RESEARCH WILL BE OFFERED TO THE HEAD OF THE DEPARTMENT OF PSYCHOLOGY FOR CONSIDERATION AND A SUMMARY OF THE RESULTS MADE AVAILABLE FOR INTERESTED PARTICIPANTS. THE RESULTS WILL' ALSO BE USED BY TOM ABSON IN HIS RESEARCH ON THE MEASUREMENT OF STRESS.

IF YOU WOULD LIKE TO PARTICIPATE IN THIS RESEARCH WHICH SHOULD TAKE NOT MORE THAN 30 MINUTES OF YOUR TIME, PLEASE INDICATE IN THE SPACE BELOW. YOU ARE UNDER NO OBLIGATION TO COMPLETE THE QUESTIONNAIRE AND THEREFORE FREE TO WITHDRAW AT ANY TIME. THERE IS ALSO NO NEED TO PROVIDE YOUR NAME OR ANY FORM OF IDENTIFICATION ON THE QUESTIONNAIRE. THE INFORMATION YOU PROVIDE IN THE QUESTIONNAIRE IS STRICTLY CONFIDENTIAL AND WILL BE DESTROYED AT THE CONCLUSION OF MY RESEARCH.

IF YOU SHOULD HAVE ANY FURTHER QUESTIONS CONCERNING THIS QUESTIONNAIRE PLEASE CONTACT TOM ABSON OR MYSELF (TEL. EXT. 4072) IN THE DEPARTMENT OF PSYCHOLOGY.

NOTE: ANY COMPLAINTS REGARDING THE CONDUCT OF THIS RESEARCH SHOULD BE DIRECTED TO THE SECRETARY OF THE UNIVERSITY OF WOLLONGONG HUMAN EXPERIMENTATION ETHICS COMMITTEE - PHONE EXT. 213079.

WOULD LIKE TO PARTICIPATE ☐ (Please Tick)

THANKING YOU FOR YOUR PARTICIPATION.

PENG LIU, DEPARTMENT OF PSYCHOLOGY

DEALING WITH STRESS
AT UNIVERSITY: A HELPFUL
CONTACT SERVICE IS THE STUDENT
COUNSELLING SERVICES
UNIVERSITY OF WOLLONGONG
TEL. EXT. (21) 3445 OR (21) 3446

Appendix B.5.1

University Environmental Scale

PLEASE READ BEFORE TURNING THE PAGE

UNIVERSITY ENVIRONMENTAL SCALE

(After Osipow, S. H., & Spokane, A. R., 1983)

This measure is called the University Environmental Scale. It is designed to measure different sources of stress people experience at university. On the answer sheet you'll notice that **YES** stands for most of the time, **NO** for rarely or never and "**?**" for sometimes. Read each statement and cross whichever of the three responses seems to fit you best for each statement. Please be sure to respond to all items, even if it is difficult to do so.

It should take you only between 5 to 10 minutes to complete the University Environmental Scale. Your first answer is the one we want.

FOR RESEARCH PURPOSES ONLY

REMEMBER

"YES" = Most of time

"?" = Sometimes

"NO" = Rarely or Never

	YES	?	NO
1. At university I am expected to do too many different coursework assignments in too little time.	☐	☐	☐
2. I feel that my study responsibilities are increasing.	☐	☐	☐
3. I am expected to complete coursework for which I have not been taught.	☐	☐	☐
4. I have to take coursework home with me.	☐	☐	☐
5. I have the resources I need to get my assignments done.	☐	☐	☐
6. I feel competent in what I do at university.	☐	☐	☐
7 I complete coursework under tight time deadlines.	☐	☐	☐
8. I wish that I had more time to deal the study demands placed upon me at university.	☐	☐	☐
9. My course requires me to work on several equally important subjects at once.	☐	☐	☐
10. I am expected to do more study than is reasonable.	☐	☐	☐
11. I feel that my coursework is progressing about as well as I hoped it would.	☐	☐	☐
12. I feel that my coursework fits my abilities and interests.	☐	☐	☐
13. I am bored with my university course.	☐	☐	☐
14 I feel I have enough responsibility for my coursework at university.	☐	☐	☐

REMEMBER

"YES" = Most of time

"?" = Sometimes

"NO" = Rarely or Never

	YES	?	NO
15. I feel my studies are making full use of my talents.	☐	☐	☐
16. I feel my university course will provide me with a good future.	☐	☐	☐
17. I am able to satisfy my need for success and recognition from my studies.	☐	☐	☐
18. I feel overqualified for my coursework.	☐	☐	☐
19. I learn new knowledge from my coursework.	☐	☐	☐
20. I have to perform coursework tasks that are beneath my ability.	☐	☐	☐
21. Lecturers and tutors provide me with useful feedback about my coursework.	☐	☐	☐
22. It is clear what I have to do to get high grades for my coursework.	☐	☐	☐
23. I am uncertain about what I am expected to accomplish in my coursework.	☐	☐	☐
24. When faced with several coursework assignments, I know which one should be done first.	☐	☐	☐
25. I know where to begin new coursework assignments when given to me.	☐	☐	☐
26. My lecturers ask for one thing, but really want another.	☐	☐	☐
27. I understand what is acceptable personal behaviour at university (e.g. dress, interpersonal relations etc)	☐	☐	☐
28. The priorities of my coursework are clear to me.	☐	☐	☐
29. I have a clear understanding of how my lecturers expect me to spend my time.	☐	☐	☐

REMEMBER

"YES" = Most of time

"?" = Sometimes

"NO" = Rarely or Never

	YES	?	NO
30. I know the basis on which I am evaluated at university.	☐	☐	☐
31. I feel conflict between what my lecturers expect me to do and what I think is right or proper.	☐	☐	☐
32. I feel caught between student factions at university.	☐	☐	☐
33. I have more than one person telling me how to study at university.	☐	☐	☐
34. I feel I have a stake in the success of my university studies.	☐	☐	☐
35. I feel good about the coursework I do.	☐	☐	☐
36. My lecturers have conflicting ideas about what I should be doing.	☐	☐	☐
37. I am proud of being a student at university.	☐	☐	☐
38. It is clear to me who really runs things at this university.	☐	☐	☐
39. I have divided loyalties at this university.	☐	☐	☐
40. The coursework I do has as much payoff for me as for the university.	☐	☐	☐
41. I attend more lectures and tutorials during my day at university than I prefer.	☐	☐	☐
42. I spend time concerned with the problems others at university bring to me.	☐	☐	☐
43. I am responsible for the welfare of other students at this university.	☐	☐	☐
44. People at university look to me for leadership.	☐	☐	☐

REMEMBER

"YES" = Most of time

"?" = Sometimes

"NO" = Rarely or Never

	YES	?	NO
45. I have responsibility for the activities of other students.	☐	☐	☐
46. I worry about whether the students in my study group will get things done properly.	☐	☐	☐
47. Some of my fellow students are really hard to deal with.	☐	☐	☐
48. If I make mistakes in my coursework, the consequences for myself and other students can be fairly bad.	☐	☐	☐
49. My studies at this university demand that I handle angry lecturers and tutors.	☐	☐	☐
50. I like the people I study with.	☐	☐	☐
51. I have an erratic time/task coursework schedule.	☐	☐	☐
52. At this university I am exposed to personal isolation.	☐	☐	☐

Please be sure you have answered all the questions

THANK YOU

Appendix B.5.2

Biographical Data

SOME QUESTIONS ABOUT YOU

Like all good questionnaires, we need to know a few things about you. Please be patient with this boring bit and fill it in as accurately as possible.

SEX: Male ☐ Female ☐

AGE: Under 21 ☐ 21 - 30 ☐
30 - 40 ☐ 40 - 50 ☐
Over 50 ☐

MARITAL STATUS: Married ☐ Single ☐
Divorced ☐ Defacto ☐
Widowed ☐

CURRENT TIME AT UNIVERSITY: ____ (YEARS) ____ (MONTHS)

PREVIOUS TIME AT UNIVERSITY: ____ (YEARS) ____ (MONTHS)

ACADEMIC LEVEL REACHED:

No Formal Qualifications ..... ☐
School Certificate or Equivalent..... ☐
Higher School Certificate or Equivalent..... ☐
Degree Level or Equivalent..... ☐
Higher Degree Level..... ☐

Appendix B.5.3

Study Demands Expectancy Scale (Short Form)

Study Demands Expectancy Scale (Short Form)

(After Osipow, S. H., & Spokane, A. R., 1983)

PLEASE READ THE INTRODUCTION BEFORE ANSWERING QUESTIONS

EACH OF US BELIEVE THAT THERE ARE ASPECTS OF OUR STUDY THAT WILL CAUSE US STRESS AT UNIVERSITY.

FOR EXAMPLE, SOME PEOPLE BELIEVE THAT HAVING TO DO TOO MANY DIFFERENT COURSEWORK ASSIGNMENTS IN TOO LITTLE TIME WILL CAUSE THEM STRESS AND OTHERS, THAT HAVING TO DO TOO MANY ASSIGNMENTS IN TOO LITTLE TIME WILL NOT CAUSE THEM TO FEEL STRESS.

LISTED OVER THE PAGE ARE A NUMBER OF QUESTIONS ABOUT STUDY AT UNIVERSITY.

WE DO NOT WANT TO KNOW WHETHER THESE CHARACTERISTICS ABOUT STUDY AT UNIVERSITY CAUSE PEOPLE STRESS.

RATHER, WE WANT TO KNOW **HOW LIKELY YOU BELIEVE** EACH OF THESE FEATURES ABOUT STUDY **WILL OR WILL NOT CAUSE YOU STRESS** AT UNIVERSITY.

PLEASE READ EACH ITEM CAREFULLY AND THEN **CROSS A BOX** TO SHOW HOW YOU THINK ABOUT THE ITEM.

FOR EXAMPLE, IF YOU BELIEVE HAVING TO DO SEVERAL DIFFERENT COURSEWORK ASSIGNMENTS IN TOO LITTLE TIME IS VERY LIKELY TO CAUSE YOU STRESS THEN YOU WOULD REPLY THUS:

VERY LIKELY	☒
NOT SURE	☐
VERY UNLIKELY	☐

BUT, IF YOU BELIEVE HAVING TO DO SEVERAL DIFFERENT COURSEWORK ASSIGNMENTS IN TOO LITTLE TIME WILL BE VERY UNLIKELY TO CAUSE YOU STRESS THEN YOU WOULD REPLY THUS:

VERY LIKELY	☐
NOT SURE	☐
VERY UNLIKELY	☒

NOW PLEASE TURN OVER THE PAGE AND ANSWER THE FOLLOWING QUESTIONS BY CROSSING A BOX WHICH BEST REPRESENTS YOUR ANSWER. IT SHOULD TAKE YOU ABOUT 5 MINUTES TO COMPLETE THE QUESTIONNAIRE.

	VERY LIKELY	NOT SURE	VERY UNLIKELY
1. Being expected to do too many different coursework assignments in too little time will cause me stress.	☐	☐	☐
2. Feeling that my study responsibilities are increasing will cause me stress.	☐	☐	☐
3. Having to take coursework home with me will cause me stress.	☐	☐	☐
4. Completing assignments under tight time deadlines will cause me stress.	☐	☐	☐
5. Having less time to deal with the study demands placed upon me will cause me stress.	☐	☐	☐
6. Being expected to do more study than I think is reasonable will cause me stress.	☐	☐	☐
7. Feeling that my coursework is not progressing about as I hoped it would will cause me stress.	☐	☐	☐
8. Feeling that my coursework fits my abilities and interests will cause me stress.	☐	☐	☐
9. Feeling bored with my course will cause me stress.	☐	☐	☐
10. Feeling my abilities are not being fully used in my studies will cause me stress.	☐	☐	☐
11. Feeling that my university course will provide me with a good future will cause me stress.	☐	☐	☐
12. Being able to satisfy my need for success and recognition from my study will cause me stress.	☐	☐	☐
13. Knowing which assignment should be done first when faced with several coursework assignments will cause me stress.	☐	☐	☐
14. Knowing where to begin new assignments when given to me will cause me stress.	☐	☐	☐
15. An understanding of what is acceptable personal behaviour at university will cause me stress.	☐	☐	☐
16. Being unclear about my coursework priorities will cause me stress.	☐	☐	☐

	VERY LIKELY	NOT SURE	VERY UNLIKELY
17. Having a clear understanding of how my lecturers want me spend my time will cause me stress.	☐	☐	☐
18. Knowing the basis on which my coursework is evaluated will cause me stress.	☐	☐	☐
19. Feeling conflict between what my lecturers expect me to do and what I think is right or proper will cause me stress.	☐	☐	☐
20. Feeling caught between student factions at university will cause me stress.	☐	☐	☐
21. Having more than one person telling me how to study at university will cause me stress.	☐	☐	☐
22. Having conflicting ideas of my lecturers about what I should be doing will cause me stress.	☐	☐	☐
23. Being unclear about who really runs things at this university will cause me stress.	☐	☐	☐
24. Having divided loyalties among students on my course will cause me stress.	☐	☐	☐
25. Spending time concerned with the problems others at university bring to me will cause me stress.	☐	☐	☐
26. Being responsible for the welfare of other students will cause me stress.	☐	☐	☐
27. Being looked upon for leadership at university will cause me stress.	☐	☐	☐
28. Having responsibility for the activities of others at the university will cause me stress.	☐	☐	☐
29. Worrying about whether the students in my group will get things done properly will cause me stress.	☐	☐	☐
30. Feeling that the consequences for myself and other students will be fairly bad If I make mistakes in my coursework will cause me stress.	☐	☐	☐

Please be sure you have answered all the questions

Thank You

Appendix B.5.4

Study Demands Valence Scale (Short Form)

Study Demands Valence Scale (Short Form)

(After Osipow, S. H., & Spokane, A. R., 1983)

PLEASE READ BEFORE TURNING THE PAGE

EACH OF US BELIEVES THAT THERE ARE THINGS ABOUT OR STUDIES THAT ARE GOOD OR BAD FOR US AND THEREFORE MAY INFLUENCE OUR LEARNING PERFORMANCE.

WE DO NOT WANT TO KNOW WHETHER TOUR PRESENT STUDY HAS THE FOLLOWING WORK FEATURES OR NOT.

RATHER, WE WANT TO KNOW **WHAT YOU THINK** ABOUT THESE STUDY FEATURES; I.E. - WHETHER YOU THINK THESE FEATURES **ARE GOOD OR BAD FOR YOU** AND YOUR STUDY PERFORMANCE.

PLEASE READ EACH ITEM AND THEN CROSS A BOX TO SHOW WHAT YOU THINK ABOUT THE ITEM.

FOR EXAMPLE, IF YOU THINK THAT BEING EXPECTED TO DO TOO MANY ASSIGNMENTS IN TOO LITTLE TIME WOULD MOSTLY BE GOOD FOR YOU AND YOUR LEARNING PERFORMANCE THEN YOU WOULD REPLY THUS:

MOSTLY GOOD	☒
NOT SURE	☐
MOSTLY BAD	☐

BUT, IF YOU THINK THAT AT UNIVERSITY BEING EXPECTED TO DO TOO MANY ASSIGNMENTS IN TOO LITTLE TIME WOULD MOSTLY BE BAD FOR YOU AND YOUR LEARNING PERFORMANCE YOU WOULD REPLY THUS:

MOSTLY GOOD	☐
NOT SURE	☐
MOSTLY BAD	☒

NOW PLEASE TURN OVER THE PAGE AND ANSWER THE FOLLOWING QUESTIONS BY CROSSING A BOX WHICH BEST REPRESENTS YOUR ANSWER. IT SHOULD TAKE YOU ABOUT 5 MINUTES TO COMPLETE THE LIST OF QUESTIONS.

	MOSTLY GOOD	NOT SURE	MOSTLY BAD
1. Being expected to do too many different coursework assignments in too little time is	☐	☐	☐
2. Feeling that my study responsibilities are increasing is	☐	☐	☐
3. Having to take coursework home with me is	☐	☐	☐
4. Completing assignments under tight time deadlines is	☐	☐	☐
5. Having limited time to deal with the study demands placed upon me at university is	☐	☐	☐
6. Being expected to do more study than is reasonable is	☐	☐	☐
7. Feeling that my coursework is progressing about as I hoped it would is	☐	☐	☐
8. Feeling that my course fits my abilities and interests is	☐	☐	☐
9. Being bored with my university course is	☐	☐	☐
10. Feeling that my studies are making full use of my talents is	☐	☐	☐
11. Feeling that my university course will provide me with a good future is	☐	☐	☐
12. Being able to satisfy my needs for success and recognition from my studies is	☐	☐	☐
13. When faced with several coursework assignments, knowing which one should be done first is	☐	☐	☐
14. Knowing where to begin new assignments when given to me is	☐	☐	☐
15. An understanding of what is acceptable personal behaviour at university (e.g. dress, interpersonal relations) is	☐	☐	☐
16. Being clear about the priorities of my coursework is	☐	☐	☐
17. Having a clear understanding of how my lecturers expect me spend my time is	☐	☐	☐
18. Knowing the basis on which I am evaluated at university is	☐	☐	☐
19. Feeling conflict between what my lecturers expect me to do and what I think is right or proper is	☐	☐	☐
20. Feeling caught between student factions at university is	☐	☐	☐

	MOSTLY GOOD	NOT SURE	MOSTLY BAD
21. Having more than one person telling me how to study at university is	☐	☐	☐
22. Having conflicting ideas of what my lecturers expect I should be doing is	☐	☐	☐
23. Being clear about who really runs things at this university is	☐	☐	☐
24. Having divided loyalties among students is	☐	☐	☐
25. Spending time with the problems others at university bring to me is	☐	☐	☐
26. Being responsible for the welfare of other students at university is	☐	☐	☐
27. Being looked to for leadership at university is	☐	☐	☐
28. Having responsibility for the activities of other students at university is	☐	☐	☐
29. Worrying about whether the students in my study group will get things done properly is	☐	☐	☐
30. If I make mistakes in my coursework, the consequences for myself and other students is	☐	☐	☐

Please be sure you have answered all the questions

Thank You

Appendix B.5.5

General Health Scale (GHS)

General Health Scale

(After Osipow, S. H., & Spokane, A. R., 1983; Smith, P., & Bennett, S., 1983)

THIS NEXT PIECE ASKS SOME QUESTIONS ABOUT YOUR FEELINGS, MOOD AND GENERAL HEALTH AT THE PRESENT TIME - I.E., OVER THE PAST WEEK OR SO. AGAIN THE ANSWERS ARE YES, ALWAYS (Y); NO, NEVER (N); AND SOMETIMES (S). ONCE AGAIN, THERE ARE NO RIGHT OR WRONG ANSWERS AND YOUR FIRST ANSWER IS THE ONE WE WANT.

	YES	SOMETIMES	NO
1. Lately, I am easily irritated.	☐	☐	☐
2. Stomach upsets	☐	☐	☐
3. Unplanned weightgain	☐	☐	☐
4. Lately, I have been depressed.	☐	☐	☐
5. Eye-strain	☐	☐	☐
6. coughing	☐	☐	☐
7. Erratic eating	☐	☐	☐
8. Lately, I have been feeling anxious	☐	☐	☐
9. Tiredness	☐	☐	☐
10. I have been happy lately	☐	☐	☐
11. Eat wrong foods	☐	☐	☐
12. So many thoughts run through my head at night that I have trouble falling asleep	☐	☐	☐
13. Uninterested	☐	☐	☐
14. Lately I respond badly in situations that normally wouldn't bother m	☐	☐	☐

	YES	SOMETIMES	NO
15. Flu	☐	☐	☐
16. I find myself complaining about little things	☐	☐	☐
17. Irritability	☐	☐	☐
19. Lately, I have been worrying	☐	☐	☐
20. Excess drinking	☐	☐	☐
21. Tense/anxious	☐	☐	☐
22. Aches/Pains	☐	☐	☐
23. Appetite (Hungry)	☐	☐	☐
24. I have a good sense of humour	☐	☐	☐
25. Indigestion	☐	☐	☐
26. Depression	☐	☐	☐
27. Things are going about as they should	☐	☐	☐
28. Falling/Staying Asleep	☐	☐	☐
29. Loss of appetite	☐	☐	☐
30. Lethargic (Drowsy)	☐	☐	☐

Please be sure you have answered all the questions

Thank You

Appendix B.6

Stress at University Survey
(Personal Meaning Questionnaire)

UNIVERSITY OF WOLLONGONG: DEPARTMENT OF PSYCHOLOGY

Stress at University Survey

CONSENT FORM

WELCOME TO THE STRESS AT UNIVERSITY SURVEY. MY NAME IS PENG LIU AND I AM A PASS MASTER STUDENT FROM THE DEPARTMENT OF PSYCHOLOGY AT THIS UNIVERSITY. I AM ASSISTED IN THIS RESEARCH BY TOM ABSON A PhD STUDENT IN THE DEPARTMENT OF PSYCHOLOGY. I WOULD LIKE YOUR HELP TO GATHER INFORMATION CONCERNING THE NATURE OF STRESS ASSOCIATED WITH YOUR STUDIES AT THIS UNIVERSITY.

MY OBJECTIVE IS TO IDENTIFY THE AREAS OF STRESS AT UNIVERSITY WHICH YOU BELIEVE ARE OF CONCERN TO YOU AND THE RELATIONSHIP OF THESE CONCERNS WITH YOUR CURRENT FEELING OF WELL-BEING.

THE RESULTS OF MY RESEARCH WILL BE OFFERED TO THE HEAD OF THE DEPARTMENT OF PSYCHOLOGY FOR CONSIDERATION AND A SUMMARY OF THE RESULTS MADE AVAILABLE FOR INTERESTED PARTICIPANTS. THE RESULTS WILL' ALSO BE USED BY TOM ABSON IN HIS RESEARCH ON THE MEASUREMENT OF STRESS.

IF YOU WOULD LIKE TO PARTICIPATE IN THIS RESEARCH WHICH SHOULD TAKE NOT MORE THAN 30 MINUTES OF YOUR TIME, PLEASE INDICATE IN THE SPACE BELOW. YOU ARE UNDER NO OBLIGATION TO COMPLETE THE QUESTIONNAIRE AND THEREFORE FREE TO WITHDRAW AT ANY TIME. THERE IS ALSO NO NEED TO PROVIDE YOUR NAME OR ANY FORM OF IDENTIFICATION ON THE QUESTIONNAIRE. THE INFORMATION YOU PROVIDE IN THE QUESTIONNAIRE IS STRICTLY CONFIDENTIAL AND WILL BE DESTROYED AT THE CONCLUSION OF MY RESEARCH.

IF YOU SHOULD HAVE ANY FURTHER QUESTIONS CONCERNING THIS QUESTIONNAIRE PLEASE CONTACT TOM ABSON OR MYSELF (TEL. EXT. 4Q72) IN THE DEPARTMENT OF PSYCHOLOGY.

NOTE: ANY COMPLAINTS REGARDING THE CONDUCT OF THIS RESEARCH SHOULD BE DIRECTED TO THE SECRETARY OF THE UNIVERSITY OF WOLLONGONG HUMAN EXPERIMENTATION ETHICS COMMITTEE - PHONE EXT. 213~79.

WOULD LIKE TO PARTICIPATE ☐ (Please Tick)

THANKING YOU FOR YOUR PARTICIPATION.

PENG LIU, DEPARTMENT OF PSYCHOLOGY

DEALING WITH STRESS
AT UNIVERSITY: A HELPFUL
CONTACT SERVICE IS THE STUDENT
COUNSELLING SERVICES
UNIVERSITY OF WOLLONGONG
TEL. EXT. (21) 3445 OR (21) 3446

Appendix B.6.1

Study Demands Valence Scale

Study Demands Valence Scale

(After Osipow, S. H., & Spokane, A. R., 1983)

PLEASE READ BEFORE TURNING THE PAGE

EACH OF US BELIEVES THAT THERE ARE THINGS ABOUT OR STUDIES THAT ARE GOOD OR BAD FOR US AND WHICH THEREFORE MAY INFLUENCE OUR LEARNING PERFORMANCE.

WE DO NOT WANT TO KNOW WHETHER TOUR PRESENT STUDY HAS THE FOLLOWING WORK FEATURES OR NOT.

RATHER, WE WANT TO KNOW WHAT YOU THINK ABOUT THESE STUDY FEATURES. I.E.- WHETHER YOU THINK THESE FEATURES ARE GOOD OR BAD FOR YOU AND YOUR STUDY PERFORMANCE,

PLEASE READ EACH ITEM AND THEN CROSS A BOX TO SHOW WHAT YOU THINK ABOUT THE ITEM.

FOR EXAMPLE, IF YOU THINK THAT BEING EXPECTED TO DO TOO MANY ASSIGNMENTS IN TOO LITTLE TIME WOULD MOSTLY BE GOOD FOR YOU AND YOUR LEARNING PERFORMANCE THEN YOU WOULD REPLY THUS:

MOSTLY GOOD	☒
NOT SURE	☐
MOSTLY BAD	☐

BUT, IF YOU THINK THAT AT UNIVERSITY BEING EXPECTED TO DO TOO MANY ASSIGNMENTS IN TOO LITTLE TIME WOULD MOSTLY BE BAD FOR YOU AND YOUR LEARNING PERFORMANCE THEN YOU WOULD REPLY THUS:

MOSTLY GOOD	☐
NOT SURE	☐
MOSTLY BAD	☒

NOW PLEASE TURN OVER THE PAGE AND ANSWER THE FOLLOWING QUESTIONS BY CROSSING A BOX WHICH BEST REPRESENTS YOUR ANSWER. IT SHOULD TAKE YOU ABOUT 5 MINUTES TO COMPLETE THE LIST OF QUESTIONS.

FOR RESEARCH PURPOSES ONLY

	MOSTLY GOOD	NOT SURE	MOSTLY BAD
1. Being expected to do too many different coursework assignments in too little time is	☐	☐	☐
2. Having to take coursework home with me is	☐	☐	☐
3. Being expected to complete coursework for which I have not been taught is	☐	☐	☐
4. Feeling that my study responsibilities are increasing is	☐	☐	☐
5. Having the resources I need to get my assignments done is	☐	☐	☐
6. Feeling competent in what I do at university is	☐	☐	☐
7. Completing coursework under tight time deadlines is	☐	☐	☐
8. Having limited time to deal with the study demands placed upon me at university is	☐	☐	☐
9. Having to work on several equally important subjects at once is	☐	☐	☐
10. Being expected to do more study than is reasonable is	☐	☐	☐
11. Feeling that my coursework is progressing about as I hoped it would is	☐	☐	☐
12. Feeling that my course fits my abilities and interests is	☐	☐	☐
13. Being bored with my university course is	☐	☐	☐
14. Feeling I have enough responsibility for my coursework at university is	☐	☐	☐
15. Feeling that my studies are making full use of my talents is	☐	☐	☐
16. Feeling that my university course will provide me with a good future is	☐	☐	☐
17. Feeling I am able to satisfy my needs for success and recognition from my studies is	☐	☐	☐
18. Feeling overqualified for my coursework is	☐	☐	☐

	MOSTLY GOOD	NOT SURE	MOSTLY BAD
19. Feeling that I am learning new knowledge from my coursework is	☐	☐	☐
20. Having to perform coursework tasks that are beneath my ability is	☐	☐	☐
21. Having lecturers or tutors provide me with useful feedback about my coursework is	☐	☐	☐
22. Having clear about what I have to do to get high grades for my coursework is	☐	☐	☐
23. Being uncertain about what I am expected to accomplish in my coursework is	☐	☐	☐
24. Knowing which one should be done first, when faced with several coursework assignments is	☐	☐	☐
25. Knowing where to begin new assignments when given to me is	☐	☐	☐
26. Being asked by my lecturers for one thing, when they really want another is	☐	☐	☐
27. Having an understanding of what is acceptable personal behaviour at university (e.g. dress, interpersonal relations) is	☐	☐	☐
28. Being clear about the priorities of my coursework is	☐	☐	☐
29. Having a clear understanding of how my lecturers expect me spend my time is	☐	☐	☐
30. Knowing the basis on which I am evaluated at university is	☐	☐	☐
31. Feeling conflict between what my lecturers expect me to do and what I think is right or proper is	☐	☐	☐
32. Feeling caught between student factions at university is	☐	☐	☐
33. Having more than one person telling me how to study at university is	☐	☐	☐
34. Feeling that I have a stake in the success of my university course is	☐	☐	☐
35. My feelings about the coursework I do is	☐	☐	☐

	MOSTLY GOOD	NOT SURE	MOSTLY BAD
36. Having conflicting ideas of what my lecturers expect I should be doing is	☐	☐	☐
37. Feeing proud of being a student at university is	☐	☐	☐
38. Being clear about who really runs things at this university is	☐	☐	☐
39. Having divided loyalties among students is	☐	☐	☐
40. Feeling my course has as much payoff for me as for the university is	☐	☐	☐
41. Having more lectures and tutorials during the day than I prefer is	☐	☐	☐
42. Spending time with the problems others at university bring to me is	☐	☐	☐
43. Being responsible for the welfare of other students at university is	☐	☐	☐
44. Being looked to for leadership at university is	☐	☐	☐
45. Having responsibility for the activities of other students at university is	☐	☐	☐
46. Worrying about whether the students in my study group will get things done properly is	☐	☐	☐
47. Feeling that some of my fellow students are really hard to deal with is	☐	☐	☐
48. If I make mistakes in my coursework, the consequences for myself and other students is	☐	☐	☐
49. Having to handle angry lecturers and tutors at this university is	☐	☐	☐
50. Having people whom I like to study with is	☐	☐	☐
51. Having an erratic time/task coursework schedule is	☐	☐	☐
52. Being exposed to personal isolation at university is	☐	☐	☐

Please Be Sure You Have Answered All the Questions

Thank You

Appendix B.6.2

Biographical Data

SOME QUESTIONS ABOUT YOU

Like all good questionnaires, we need to know a few things about you. Please be patient with this boring bit and fill it in as accurately as possible.

SEX: Male ☐ Female ☐

AGE: Under 21 ☐ 21 - 30 ☐
30 - 40 ☐ 40 - 50 ☐
Over 50 ☐

MARITAL STATUS: Married ☐ Single ☐
Divorced ☐ Defacto ☐
Widowed ☐

CURRENT TIME AT UNIVERSITY: ____ (YEARS) ____ (MONTHS)

PREVIOUS TIME AT UNIVERSITY: ____ (YEARS) ____ (MONTHS)

ACADEMIC LEVEL REACHED:

No Formal Qualifications ..... ☐
School Certificate or Equivalent..... ☐
Higher School Certificate or Equivalent..... ☐
Degree Level or Equivalent..... ☐
Higher Degree Level..... ☐

Appendix B.6.3

Study Demands Expectancy Scale

Study Demands Expectancy Scale

(After Osipow, S. H., & Spokane, A. R., 1983)

PLEASE READ BEFORE TURNING THE PAGE

EACH OF US BELIEVE THAT THERE ARE ASPECTS OF OUR STUDY THAT WILL CAUSE US STRESS AT UNIVERSITY.

FOR EXAMPLE, SOME PEOPLE BELIEVE THAT HAVING TO DO TOO MANY DIFFERENT COURSEWORK ASSIGNMENTS IN TOO LITTLE TIME WILL CAUSE THEM STRESS AND OTHERS, THAT HAVING TO DO TOO MANY ASSIGNMENTS IN TOO LITTLE TIME WILL NOT CAUSE THEM TO FEEL STRESS.

LISTED OVER THE PAGE ARE A NUMBER OF QUESTIONS ABOUT STUDY AT UNIVERSITY.

WE DO NOT WANT TO KNOW WHETHER THESE CHARACTERISTICS ABOUT STUDY AT UNIVERSITY CAUSE PEOPLE STRESS.

RATHER, WE WANT TO KNOW **HOW LIKELY YOU BELIEVE** EACH OF THESE FEATURES ABOUT STUDY **WILL OR WILL NOT CAUSE YOU STRESS** AT UNIVERSITY.

PLEASE READ EACH ITEM CAREFULLY AND THEN **CROSS A BOX** TO SHOW HOW YOU THINK ABOUT THE ITEM.

FOR EXAMPLE, IF YOU BELIEVE HAVING TO DO SEVERAL DIFFERENT COURSEWORK ASSIGNMENTS IN TOO LITTLE TIME IS VERY LIKELY TO CAUSE YOU STRESS THEN YOU WOULD REPLY THUS:

VERY LIKELY	☒
NOT SURE	☐
VERY UNLIKELY	☐

BUT, IF YOU BELIEVE HAVING TO DO SEVERAL DIFFERENT COURSEWORK ASSIGNMENTS IN TOO LITTLE TIME WILL BE VERY UNLIKELY TO CAUSE YOU STRESS THEN YOU WOULD REPLY THUS:

VERY LIKELY	☐
NOT SURE	☐
VERY UNLIKELY	☒

NOW PLEASE TURN OVER THE PAGE AND ANSWER THE FOLLOWING QUESTIONS BY CROSSING A BOX WHICH BEST REPRESENTS YOUR ANSWER. IT SHOULD TAKE YOU ABOUT 5 MINUTES TO COMPLETE THE QUESTIONNAIRE.

	VERY LIKELY	NOT SURE	VERY UNLIKELY
1. Being expected to complete several different coursework assignments in too little time will cause me stress	☐	☐	☐
2. Feeling that my study responsibilities are increasing will cause me stress	☐	☐	☐
3. Being expected to complete coursework for which I have not been taught will cause me stress	☐	☐	☐
5. Having the resources I need to get my assignments done will cause me stress	☐	☐	☐
6. Feeling incompetent about my coursework will cause me stress	☐	☐	☐
7. Completing coursework under tight time deadlines will cause me stress	☐	☐	☐
8. Having limited time to deal with the study demands placed upon me will cause me stress	☐	☐	☐
9. Being required to work on several equally important subjects at once will cause me stress	☐	☐	☐
10. Being expected to do more study than I think is reasonable will cause me stress	☐	☐	☐
11. Feeling that my coursework is not progressing about as I hoped it would will cause me stress	☐	☐	☐
12. Feeling that my coursework fits my abilities and interests will cause me stress	☐	☐	☐
13. Being bored with my university course will cause me stress	☐	☐	☐
14. Feeling I have too much responsibility for my coursework will cause me stress	☐	☐	☐
15. Feeling that my studies are making full use of my talents will cause me stress	☐	☐	☐
16. Feeling that my university course will provide me with a good future will cause me stress	☐	☐	☐

	VERY LIKELY	NOT SURE	VERY UNLIKELY
17. Being able to satisfy my needs for success and recognition from my studies will cause me stress	☐	☐	☐
18. Feeling I am overqualified for my coursework will cause me stress	☐	☐	☐
19. Learning new knowledge from my coursework will cause me stress	☐	☐	☐
20. Having to perform coursework tasks that are beneath my ability will cause me stress	☐	☐	☐
21. Feeling that lecturers and tutors do not provide useful feedback about my assignments will cause me stress	☐	☐	☐
22. Being clear about what I have to do to get high grades will cause me stress	☐	☐	☐
23. Being uncertain about what I am expected to accomplish in my coursework will cause me stress	☐	☐	☐
24. Knowing which assignment should be done first when faced with several coursework assignments will cause me stress	☐	☐	☐
25. Knowing where to begin new assignments when given to me will cause me stress	☐	☐	☐
26. Being asked by my lecturers for one thing, when they really want another will cause me stress	☐	☐	☐
27. An understanding of what is acceptable personal behaviour at university will cause me stress	☐	☐	☐
28. Being unclear about my coursework priorities will cause me stress	☐	☐	☐
29. Having a clear understanding of how my lecturers want me spend my time will cause me stress	☐	☐	☐
30. Knowing the basis on which my coursework is evaluated will cause me stress	☐	☐	☐
31. Feeling conflict between what my lecturers expect me to do and what I think is right or proper will cause me stress	☐	☐	☐

	VERY LIKELY	NOT SURE	VERY UNLIKELY
32. Feeling caught between student factions at university will cause me stress.	☐	☐	☐
33. Having more than one person telling me how to study at university will cause me stress.	☐	☐	☐
34. Feeling I have a stake in the success of my university course will cause me stress.	☐	☐	☐
35. Feeling good about the coursework I do will cause me stress	☐	☐	☐
36. Having conflicting ideas of what my lecturers expect I should be doing will cause me stress	☐	☐	☐
37. Feeing proud of being a student at university will cause me stress	☐	☐	☐
38. Being unclear about who really runs things at this university will cause me stress	☐	☐	☐
39. Having divided loyalties among students at university will cause me stress	☐	☐	☐
40. Feeling that my course has as much payoff for me as as for the university will cause me stress	☐	☐	☐
41. Having more lectures and tutorials during the day than I prefer will cause me stress	☐	☐	☐
42. Spending time concerned with the problems others at university bring to me will cause me stress	☐	☐	☐
43. Being responsible for the welfare of other students will cause me stress	☐	☐	☐
44. Being looked upon for leadership at university will cause me stress	☐	☐	☐
45. Having responsibility for the activities of others university will cause me stress.	☐	☐	☐
46. Worrying about whether the students in my group will get things done properly will cause me stress.	☐	☐	☐
47. Finding it hard to hard to deal with some of my fellow students will cause me stress.	☐	☐	☐

	VERY LIKELY	NOT SURE	VERY UNLIKELY
48. Feeling that the consequences for myself and other students will be fairly bad If I make mistakes in my coursework will cause me stress.	☐	☐	☐
49. Having to handle angry lecturers and tutors at university will cause me stress.	☐	☐	☐
50. Feeling that I like the people I like to study with will cause me stress.	☐	☐	☐
51. Having an erratic time/task coursework schedule will cause me stress.	☐	☐	☐
52. Being exposed to personal isolation at university will cause me stress.	☐	☐	☐

Please Be Sure You Have Answered All the Questions

Thank You

Appendix B.6.4

General Health Scale (GHS)

General Health Scale

(After Osipow, S. H., & Spokane, A. R., 1983; Smith, P., & Bennett, 1983)

THIS NEXT PIECE ASKS SOME QUESTIONS ABOUT YOUR FEELINGS, MOOD AND GENERAL HEALTH AT THE PRESENT TIME - I.E., OVER THE PAST WEEK OR SO. AGAIN THE ANSWERS ARE YES, ALWAYS (Y); NO, NEVER (N); AND SOMETIMES (S). ONCE AGAIN, THERE ARE NO RIGHT OR WRONG ANSWERS AND YOUR FIRST ANSWER IS THE ONE WE WANT.

	YES	SOMETIMES	NO
1. Lately, I am easily irritated.	☐	☐	☐
2. Stomach upsets	☐	☐	☐
3. Unplanned weightgain	☐	☐	☐
4. Lately, I have been depressed.	☐	☐	☐
5. Eye-strain	☐	☐	☐
6. coughing	☐	☐	☐
7. Erratic eating	☐	☐	☐
8. Lately, I have been feeling anxious	☐	☐	☐
9. Tiredness	☐	☐	☐
10. I have been happy lately	☐	☐	☐
11. Eat wrong foods	☐	☐	☐
12. So many thoughts run through my head at night that I have trouble falling asleep	☐	☐	☐
13. Uninterested	☐	☐	☐
14. Lately I respond badly in situations that normally wouldn't bother me	☐	☐	☐

	YES	SOMETIMES	NO
15. Flu	☐	☐	☐
16. I find myself complaining about little things	☐	☐	☐
17. Irritability	☐	☐	☐
19. Lately, I have been worrying	☐	☐	☐
20. Excess drinking	☐	☐	☐
21. Tense/anxious	☐	☐	☐
22. Aches/Pains	☐	☐	☐
23. Appetite (Hungry)	☐	☐	☐
24. I have a good sense of humour	☐	☐	☐
25. Indigestion	☐	☐	☐
26. Depression	☐	☐	☐
27. Things are going about as they should	☐	☐	☐
28. Falling/Staying Asleep	☐	☐	☐
29. Loss of appetite	☐	☐	☐
30. Lethargic (Drowsy)	☐	☐	☐

Please be sure you have answered all the questions

Thank You

Appendix C

Study 3

Study 3

Stress in Migrant Education Programmes: The Relative Effect of Common Work Stressors and Stressor Expectancy on the Variance in Strain

The material presented in Study 3 is a secondary data analysis of a study conducted by Master of Science (Pass) student Rudi Stockling and jointly supervised by Assoc. Prof. Peter Smith and the author in the Department of Psychology at the University of Wollongong, NSW, Australia. The research was conducted by Rudi Stockling in partial fulfilment of the empirical research requirements for the post-graduate Master of Science (Pass) degree offered by the Department of Psychology. The secondary analysis of the data is both conceptually and empirically independent from that presented by Rudi Stockling.

C.1 Abstract

Previous research has shown that the appraised expectancy of common work stressors contributes useful information to the explained variance in strain. In addition, it has also found that the personal valence of common work stressors does not explain additional variance in strain. However, as concluded from the results, it may be the case that personal valencies may in effect function as descriptors or cognitive labels for the expectancy of stressors. Therefore, on the basis of these results, the present study sought to further explore the relative effect of stressor expectancy on the explained variance in strain.

The results from 63 migrant education teachers show that stressor expectancy contributes useful information to the explained variance in strain. From the exploratory baseline models, the effect of common role-boundary work stressors explained 12.30% (adj) of the variance in strain and the expectancy of role-overload stressors, a reduced 4.70% (adj) of the variance in strain. Furthermore, the model of best fit explained an

increased 16.50% (adj) of the variance in symptoms of strain from the cumulative effect of common role-boundary stressors and the expectancy of role-overload stressors. That is, the model illustrates that the expectancy of common work stressors contributes useful information to the explained variance in strain when in the presence of common role-boundary stressors. Hierarchical modelling found support for the hypothesis that the incremental effect of personal meaning of stressors would explain additional variance in strain when placed in the presence of common role-boundary stressors. The results indicate that the expectancy assigned to role-overload stressors adds 4.20% (adj) to the 12.30% (adj) of the variance in strain explained by common role-boundary stressors; that is, in proportional terms, 34.15% of the variance explained by the model.

In addition, regression analyses explored the relative efficiency of Physical, Psychological and Composite Strain scales to capture or account for the translation of stress to symptoms of strain. These analyses indicate (a) that the use of strain scales with significant skewness inflate the variance in strain explained by the regression model and (b) that a composite (i.e., physical/psychological) approach to the self-report measurement of strain is the more efficient, specific and versatile method by which to measure symptoms in strain. Directions for future research are discussed.

C.2 Introduction

The results from studies one and two have shown that expectancy appraisals of common stressors (a) often explain a significant percentage of the variance in strain and (b) contribute useful information to the explained variance when in the presence of common stressors. In contrast, the personal valence attributed to common stressors has consistently failed to add useful information to the explained variance in strain. Thus, given the consistency of the results from these two studies, it is reasonable to conclude

that the valence attributed to stressors (i.e., the positive or negative attraction of common stressors) is not directly related to symptoms of strain (i.e., predictors of strain). Therefore, on the basis of this result, valence stressors may be seen as redundant or non-significant predictors in the measurement model. This conclusion, however, does not deny or eliminate the possibility that valence appraisals may in effect play an active, although perhaps secondary role, in the transactional process underlying stress and the translation to symptoms of strain.

Furthermore, as evident from study two, graphical and correlational data for the commensurate expectancy and valence scales indicates that the distribution of the valence responses is determined by (a) the fusion of expectancy and valence appraisals and (b) the underlying effect of individual differences in the disposition for hardiness. The data implies that valence appraisals function as descriptors or cognitive labels for the underlying expectancies associated with common stressors (i.e., the probability of stress from the effects of the stressor). Thus, given the weight of evidence from previous research that (a) personal valence stressors are unlikely to predict symptoms of strain and (b) that valence appraisals are ostensibly descriptors of expectancy stressors, they were dropped from the measurement model for the present study.

The present study sought to explore the relative effect of common work stressors and the expectancy of common work stressors associated with teaching english to adult migrants in a migrant education programme on symptoms of strain. That is, it sought to further explore the relative ability of stressor expectancy to contribute useful information to the explained variance in strain beyond that explained by common work stressors. Therefore, the principal aim of the study was to identify the relative effect of stressor expectancies (i.e., appraisal of common work related stressors) when in the presence of common work stressors (i.e., recognition or description of work stressors).

In other words, the study sought to show that the expectancies assigned to common work stressors (i.e., the probability or expectation of stress from the properties of the stressor) explains additional variance in strain beyond that explained by common work stressors (i.e., the recognition or descriptive nature of common stressors associated with teaching in a migrant education programme). In addition, based on the results from study two, the secondary aims of the study were to:

1. Explore the relative effect of commensurate common work stressors and stressor expectancy when in the presence of each other on the variance in symptoms of strain. That is, these analyses sought to identify the functional involvement or significance of parallel recognition and expectancy dimensions of appraisal in the appraisal of discrete stressors.

2. Explore the effectiveness and efficiency of physical, psychological and composite measures of strain to capture the effect of common work stressors and stressor expectancy sources of stress (see Appendix C.7).

Thus, following on from the findings of studies 1 & 2, this study sought to test the following hypotheses, that:

H1 The expectancy assigned to common work stressors would explain a significant percentage of the variance in symptoms of strain.

H2. The relative effect of stressor expectancy would contribute useful information to the explained variance in strain when in the presence of common work related stressors.

H3 The incremental effect of stressor expectancy would add significant information to the explained variance in strain when placed in the presence of common work stressors.

C.3 Method

C.3.1 Participants

Sixty four teachers employed in a migrant education programme teaching english to adult migrants volunteered to take part in the study. The sample includes 95.0% of the 68 english teachers employed by the organisation. Of the participants, 58 were female

teachers and six were male teachers. Furthermore, 90.0% of the teachers involved in the study were fully qualified language teachers. The mean age of the teachers was 36 years and the ages ranged from 26 to 63 years.

C.3.2 Self-Report Measurement

Self-Report scales were used to measure (a) the recognition (i.e., description) of common work stressors; and (b) the expectancy (i.e., personal meaning) assigned to common work stressors associated with teaching english to adult migrants. In addition, self-report measures of strain were used to measure the symptoms of strain more recently experienced by the teachers during their work as teachers (see Appendix C.9, Sources of Work Stress Survey). Specifically, a self-report inventory designed to measure (a) the frequency of common role-ambiguity, role-boundary and role-overload work stressors; (b) the intensity of expectancy demands related to common role-ambiguity, role-boundary and role-overload work stressors; and (c) physical and psychological strain was used to measure the nature of work stressors and symptoms of strain experienced by the teachers.

C.3.2.1 The Selection of Work Stressors Using the Critical Incident Technique

The "critical incident technique" (Flanagan, 1954, p.327) was used as the basis to (a) identify the nature of major context specific stressors experienced by the teachers and (b) select nomothetic self-report scales to measure situational stressors specific to this teaching context (Dewe, 1986, 1989, 1991a; Barone, 1995; O'Driscoll & Cooper, 1994; Travers & Cooper, 1993). As Flanagan argued, the technique provides a systematic method of data collection which may be used by an interviewer to observe and describe the nature of human activity related to a specific occupation or designated work task. Flanagan (1954) defined a critical incident as . . .

any observable human behaviour that permits inferences and predictions to be made about the observed behaviour. (Further, for the event to be seen as critical), the incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects (p. 327).

Therefore, in terms of utility, the methodology has practical relevance when there is a need to explore . . . "observed incidents which have special significance and (which) meet systematically defined criteria" (p. 327). That is, the technique is especially useful when there is a need to (a) explore or solve "practical problems" and (b) "develop broad psychological principles" by which to explain human activity (Flanagan, 1954, p. 327). For example, the technique has advantage when there is a need to identify the more common stressors that impinge a particular work population or context. As Crump et al. (1980) argue, the use of pre-designed questionnaires may not necessarily be appropriate when there is a need to identify occupational specific stressors. In particular, as they further point out, pre-designed questionnaires have . . . "the fundamental disadvantages of (1) excluding important stressors at work (as perceived by the work force themselves) and (2) distorting the importance or valence of those that are included" in the questionnaire (p. 191).

Therefore, the suggestion that pre-designed questionnaires have serious limitations implies that nomothetic instruements are perhaps redundant or invalid measures of occupational stressors. But, in effect not so, situational specific research (e.g., critical incident technique) has particular relevance where there is a need to identify major situational factors as a preliminary criterion to be used for the selection of nomothetic scales to measure occupational stressors (Barone, 1995). As Dewe (1991a) points out, although the critical incident technique has its difficulties, it does provide the means whereby it is possible to explore distinctions in the nature of common situational stres-

sors. Dewe notes the inherent utility of this exploritory technique and concludes: "From the pool of data, new and redefined stressors can be established which reflect occupationally relevant and individually expressed events rather than events primarily established on a priori grounds" (p. 89).

For the present study, then, a critical stressor event (i.e., major stressor) is a situational stressor that is common to the teaching context and frequently experienced by the teachers in their work as teachers. Dewe (1989), for example, in a series of preliminary critical incident interviews used (a) the open ended questions: "Can you think of a particular time at work when you felt under pressure tension of stress? Can you tell me what happened?" and (b) a content analysis of the responses to explore the qualitative nature of work stressors and their effect on the participants health, personal relationships and job satisfaction. As Dewe points out, if research is to improve . . .

> our understanding of the transactional nature of stress then there is a need to move beyond the more traditional quantitative approaches to the measurement of stressors. There is need to adopt (a) alternative (qualitative) methodologies which are designed to more adequately reflect the different dynamics of the stress process; and (b) research that is designed to capture the emic (idiographic) aspects of the experience of stress, that is, the participants own view of reality (pp. 996-997).

C.3.2.2 Selection of Common Work Stressor Scales

The selection of nomothetic stressors scales to measure the more common work stressors experienced by the teachers followed a three stage process that involved (a) generating a list of work related stressors which are common in the teaching context; (b) the formulation of critical incident questionnaires representing the more common work stressors experienced by teachers in general; (c) individual interviews with a small sample of teachers to identify the more common sources of stress peculiar to the

migrant education programme; and (d) the selection of stressor scales to measure the frequency of the more common work stressors identified by the sample of eight teachers.

The process first required a review of the stress literature to generate a list of potential work stressors related to occupational stress (Cooper & Marshall, 1976, 1978; Cooper & Davidson, 1987; Cooper et al. 1988; Cox, Boot & Cox, 1989; Davidson & Cooper, 1984; Ivancevich & Matteson, 1980, 1984; Karasek, 1979; Levi, 1987; Osipow & Spokane, 1983; Pratt & Barling, 1987; Sutherland & Cooper, 1988). For example, Sutherland and Cooper argue that sources of work stress may be classified within the stressor categories (a) intrinsic to the job, (b) job role, (c) career, (d) relationships, (e) organisational, (f) intrinsic to the individual and (g) those related to the interface between home and work.

The list of potential work stressors was then compared with the results from stress research concerned with stress in the teaching profession and a list of the stressors frequently evident in teaching was then compiled from the lists of stressors. From this procedure, 21 stressors were identified as the most frequent sources of stress experienced by teachers (Cox, Boot & Cox, 1989; Dewe, 1986; Fimian, 1984; Hart, 1995; Hart & Wearing, 1995; Payne & Fletcher, 1983; Pettigrew & Wolf, 1982; Travers & Cooper, 1993).[C1] Similarly, Travers and Cooper (1993) from a random sample of 1790 U.K. teachers found that "lack of support from government" (i.e., 85.1%) and "constant change within the profession" (i.e., 84.0%) were given the highest priority as sources of stress by the respondents. Further, when this result is compared to the 21 most frequent

[C1] The stressors role-ambiguity, role-boundary, role-conflict, role-insufficiency, role-overload (quantitative and qualitative), responsibility, physical environment, politics, professional development, rewards, participation, organisational management, organisational structure, resource adequacy, student problems, future uncertainty, social support, loyalty conflicts, career progress and job scope were the most frequent stressors related to teaching.

stressors evident in stress research (see footnote 1), the stressors "lack of support" and "constant change" may be seen as essentially similar to organisational structure and future uncertainty sources of stress respectively.

The 21 stressors were then used to formulate 20 critical incident questionnaires with five point response categories and space for participants to give an example of a specific situation where they had experienced the effect of the stressor on their teaching performance or personal well-being (see Appendix C.8, Sources of Work Stress Survey).[C2] For example, the critical incident "Future Uncertainty" was described as "The extent to which you feel uncertain about job security" and assessed by the participants using the response categories (1) I never feel uncertain about job security, (2) I rarely feel uncertain about job security, (3) I occasionally feel uncertain about job security, (4) I often feel uncertain about job security and (5) I always feel uncertain about job security. In addition, the statement "Give an example of a situation where you felt uncertain about your job security" gave participants the opportunity to expand their views on the nature and effect of "future uncertainty" critical incidents.

The critical incident questionnaires were then used by a sample of teachers to identify the more frequent stressors peculiar to the teaching programme (see Appendix C.8). Specifically, a sample of eight volunteers drawn from each of the teaching areas involved in teaching english to adult migrants were each interviewed individually and completed the critical incident questionnaires during this interview. From these results, the stressors role-conflict/ boundary, politics, participation, organisational management, organisational structure and career progress were identified as the more frequent sources of stress experienced by the teachers in this teaching environment. That is,

---

[C2] Due to their similarity, the stressors role-conflict and role-boundary were combined to form a single critical incident.

critical incidents with total scores greater than 29 (i.e., a score 65.0% above the minimum score for the possible 8 - 40 range of the scale) determined the acceptance or rejection of critical stressors as more frequent sources of stress.

For the measurement of critical stressors, one option was to develop situational specific stressor scales; the alternative and preferred option, was to align the critical incidents with nomothetic scales which measure the frequency (i.e. recognition) of common work stressors. From subsequent comparisons with nomothetic stressor scales, the range of critical incidents were found to by and large correspond with items used in the OSI Role-Ambiguity, Role-Boundary and Role-Overload stressor scales (Osipow & Spokane, 1983, 1987). The critical incident "Career Progress" showing a correspondence with items in the Role-Ambiguity scale; the incidents "Organisational Management" and "Structure" with the Role-Overload scale; and the incidents "Role-Conflict/Boundary" and "Politics" with the Role-Boundary scale. As a result, the OSI stressor scales Role-Ambiguity, Role-Boundary and Role-Overload were included in the measurement model and later used to measure the perceived frequency of common stressors imposed on the teachers in this teaching context (see Appendix C.9).

C.3.2.3 Measurement of Stressor Expectancy

Previous research (i.e., studies 1 & 2) has shown that the expectancy scales reflect acceptable skewness and reliability psychometric properties. Furthermore, the values for skewness and reliability are comparable with those for the OSI stressor scales (see Appendix B.3.2, Table B.5 for summary data). For instance, from the data for study one, the skewness coefficients for the two item expectancy scales average a low -0.42; and the α coefficients for internal consistency, on average a moderate 0.74 for the scales. In contrast, the interscale correlations indicate the existence of a moderate overlap

between the ambiguity, boundary and overload expectancy scales (see Table 3.2.1.3). However, as evident from the table, the correlations are below the r = 0.70 criterion for redundancy and therefore, may be seen as essentially independent in nature (Tabachnick & Fidell, 1989). As a result, the more general two item expectancy scales Role-Ambiguity, Role-Boundary and Role-Overload were used to measure expectancies of stress from the respective common work stressors. Refer sections 3.2.1.3.2.4, 3.2.1.3.2.4.1 and 3.2.1.3.2.4.2 for a detailed description of the expectancy scales.

C.3.2.4 Measurement of Strain

The multi-dimensional 20 item Personal Health Scale used in study two was used to measure how often the participants suffer from symptoms of physical strain (see Appendix C.9.3, Personal Health Scale). Responses to the scale items were recorded using the three point response scale "Yes (3) "Sometimes (2) and "No" (1). That is, the scale is designed to sample the perceived frequency of physical strain complaints. Further, as discussed in study two, this scale is formed from the 10 items used in the OSI Physical Strain scale and 10 items drawn from the three factor solution that resulted from the factor analysis of 24 minor health items (see 3.2.2.3.2.2). As a result, this scale may be seen as a composite measure of strain which measures malaise/neurosis, infections and aches/pains dimensions of health. The results from study two indicate that the responses to the scale items are normally distributed (i.e., 0.22 & 0.33) and the scale acceptable reliability properties (i.e., α = 0.87 & 0.83). Further, due to the similarity of items intended to tap eating related problems, the OSI physical strain item "erratic eating" was deleted from the Personal Health Scale. As a result, the scale includes 19 items which measure minor psychological, behavioural and physiological health complaints.

The 10 item Psychological Strain scale from the OSI inventory (Osipow & Spokane, 1983, 1987) was used to measure the current intensity of psychological symptoms of strain experienced by the participants (see Appedix C.9.4, Psychological Strain Scale). The instructions for the scale ask participants to consider their feelings and mood at present and indicate their response to the scale items using the three point response scale "Yes (3) "Sometimes (2) and "No (1). That is, subtle changes in the wording of the instructions effectively change the emphasis of the scale from "how frequently" to "how much at present" (i.e., the intensity of the symptom). Descriptive data from the OSI inventory and likewise studies one and two indicate that the scale has acceptable psychometric properties for skewness and reliability for the items used in the scale. For instance, the descriptive data from study two (see Appendix B, Tables B.1 & B.4) indicates that the responses to the scale are normally distributed (i.e., skew coefficients 0.46 and 0.44) and the scale high reliability (i.e. $\alpha = 0.84$ and 0.87).

In addition, a 29 item Composite Strain scale is formed from the items used in the Personal Health and Psychological Strain scales. As evident from study two (see Appendix B, Tables B.1 & B.4), descriptive data indicates that the 30 item scale is normally distributed (i.e., skew values 0.30 and 0.41) and the internal consistency of the scale items as high (i.e., $\alpha = 0.90$ and 0.88). Furthermore, correlations with the Personal Health (i.e., 0.97** & 0.96**) and Psychological Strain (i.e., 0.89** & 0.87**) scales indicate (a) that the Composite Strain scale reflects the underlying nature of the physical and psychological stain items and (b) that the parent scales are in effect redundant when used alongside the Composite Strain scale (see Tables 3.2.2.2 & 3.2.2.10).

C.3.3 Design and Materials

This correlational field study required participants to answer an inventory with four questionnaires and a total of 65 items. Therefore, due to the small number of items,

problems with mental fatigue and boredom with the task were not expected to adversely influence the responses to the scale items.

C.3.4 Procedure

Following approval from the management of the adult education programme, participants were approached at their place of work and asked if they would participate in the research. Participants were informed that the research was concerned with stress at work and given a brief explanation of the inventory. They were then asked to complete the inventory when able and return the completed questionnaires to the researcher. Using this method, 64 of the 68 english teachers employed in the adult education programme agreed to take part in the study, that is, a participation rate of 95.0%. Subsequently, 64 completed questionnaires were returned to the researcher. A response rate of 100% from the distributed questionnaires.

C.4 Results

C.4.1 Data Screening and Normality Assumptions

Descriptive statistics, frequency plots and a series of multiple regression analyses were used to screen the raw data (n = 64) for evidence of (a) non-random missing values, (b) violation of the assumptions for normality and linearity and (c) the presence of univariate and multivariate outliers in the data set (Orr et al., 1991; Tabachnick & Fidell, 1989). From the initial screening of the data set, there was no evidence of missing values.

Frequency plots explored the normality of the variables used in the measurement model. Where necessary univariate outliers and values distant from the general distribution were recoded to values less distant from the next most deviant value in an at-

tempt to improve the normality of the data distribution (Orr et al. (1991; Tabachnick & Fidell, 1989). Variables with extreme skew coefficients (see Table C.1) were then transformed to normal distributions using square root transformations of the data.[C3]

In addition, a series of regression analyses explored the data for evidence of multivariate outliers. From these analyses one case was identified as a multivariate outlier and removed from the data set. The remaining 63 cases in the data set, however, do not provide the desired power of 0.80 at α 0.05 (Two Tailed) with which to detect a signifi-cant medium effect size (ES) of 0.15 from the effect of k = 3 independent variables (IV's) in a regression model (Cohen, 1992, Table 2, p. 158).[C4] As Cohen notes, to detect a medium ES of 0.15, a sample size n = 76 is required to achieve a desired power of 0.80 at α 0.05 (two tail). However, the data from study two indicates that an average ES of approximately 0.20 (see Table 3.2.2.13) may be expected from the effect of k = 3 IV's. Therefore, on the basis of an expected ES of $\approx$ 0.20, a sample size of n = 48 provides the desired power of 0.80 at α 0.05 (Two Tailed) to detect a significant effect from k = 3 IV's (Cohen & Cohen, 1983). Furthermore, the case to IV ratio of 21:3 satisfies the requirement for a minimum of five cases to each IV in multiple regression analyses (Tabachnick & Fidell, 1989). It should be noted, however, the acceptance of an expected larger ES increases the probability of incurring an increase in Type 2 errors (Cohen, 1992). Significant effects in the model less than an ES of $\approx$ 0.20 may in effect be overlooked or rejected as insignificant due to the limits imposed by a small sample size.

[C3] See footnote 1, Chapter 3.2.2.5.1 re values for skewness. This study has adopted a more conservative approach to normality and used an alpha level of .023 to determine maximum skewness. Skew coefficients greater than two SE's (i.e., 0.604) were considered to reject the null hypothesis for skewness

[C4] See footnote 2, Chapter 3.2.2.5.1 for a discussion on the calculation of desired power for single set multiple regression analyses.

C.4.2 Descriptive Statistics

Descriptive statistics for n = 63 are shown in Table C.1; comparative statistics with the OSI normative data (see Osipow & Spokane, 1983, 1987) and study one are presented in Table C.2.

The mean score for the OSI stressor scale Role-Overload (28.18) is noticeably higher than the mean scores for other OSI stressor scales. Similarly, the mean score for the expectancy Role-Overload scale (12.00) is also higher than the mean scores for the other expectancy scales. In both cases, the higher mean scores reflect the effect of variability in the range of responses and skewness in the distribution of the response to items in the respective scales. As the variability data for the OSI Overload scale indicates, the wider SD (7.15), more negative skew in the observed responses (i.e., 14 - 43) and the more normal distribution (i.e., skew = 0.117) results in a higher mean score for this scale. Conversely, for the expectancy overload scale, the more narrow SD (1.51), constriction in the observed range of responses (i.e., 7 - 14) and the significant negative skewness of the response distribution (i.e., skew = -0.923) subsequently reflect in the higher mean score for this scale. In effect, the higher mean scores indicate that the responses to both scales tend to fall within the stressful region of the response scales (i.e., "most of the time" and "will cause me stress" respectively). In other words, the mean scores indicate that the perceived frequency and expected effect of common role-overload stressors are seen as respectively (a) the most frequent stressors (i.e., sources of demand) experienced by this sample and (b) the most likely sources of stress for this sample. Furthermore, the data indicates that common (i.e., recognition) and expectancy overload stressors are likely to function as significant predictors of strain for this sample.

Table C.1
Descriptive Statistics

Scale	Mean	SD	Scale Range#	Observed Range	Skew	Tran/Var Skew##	Alpha
Stressor (OSI)							
Role-Ambiguity	22.81	6.75	10 - 50	10 - 42	0.500	----	.81
Role-Boundary	23.25	6.37	10 - 50	11 - 40	0.147	----	.68
Role-Overload	28.18	7.15	10 - 50	14 - 43	0.117	----	.79
Expectancy							
Role-Ambiguity	10.29	2.60	2 - 14	2 - 14	-0.757	-0.181	.55
Role-Boundary	11.13	2.17	2 - 14	3 - 14	-1.200	0.081	.63
Role-Overload	12.00	1.51	2 - 14	7 - 14	-0.923	-0.005	.66
Strain							
Physical	12.03	6.37	0 - 48#	2 - 36	1.496	0.594	.76
Psychological	8.30	5.93	0 - 30	0 - 26	1.150	0.031	.82
Composite Strain+	16.00	9.125	0 - 63#	3 - 48	1.332	0.564	.84

Note: n = 63; +Composite Scale Formed From Items used in the Physical and Psychological Strain Scales; Tran/Var Skew## - Variable Transformed to Reduce Skewness; Scale Range# - Variables Removed to Improve the Reliability or Face Validity of the Scale.

Although not obvious from the data, the mean scores for the Physical Strain (12.03), Psychological Strain (8.30) and Composite Strain (16.00) scales are approximately 50.0% below the expected value from the scale range and a normal distribution of the responses to the respective scales.[C5] The scale range for the Physical Strain (i.e., 0 - 48), Psychological Strain (i.e., 0 - 30) and Composite Strain (i.e., 0 - 63) scales indicate that the expected mean scores for the scales are 25.0, 15.0 and 31.0 respectively. As the variability data for the strain scales indicate, the underlying effect of constrictions in the range of responses and significant positive skewness in the distribution of responses to the strain scales (i.e., greater than 0.604) effectively deflates the scores for the strain

[C5] This assumes that the theoretical mean, mode and median indices for the sample align with the mid point for the range of the response scales (Jaccard & Becker, 1990). For example, from a scale range 10 - 50, the theoretical mean and expected ≈ SD for the OSI stressor Role-Overload scale are 30.0 and 10.0 respectively. However, although normally distributed, the empirical mean of 28.18 is slightly lower than expected and reflects (a) the restricted range of responses (i.e., 14 - 43); (b) the more narrow SD for the scale (i.e., 7.15) ; and (c) the slight positive skewness (i.e., skew 0.117) in the distribution of the scale responses.

scales. For instance, the combined effect from the observed range of responses for the Composite Strain scale (i.e., 3 - 48) and the significant positive skewness of the scale (i.e., skew = 1.332) subsequently deflates the mean score (i.e., 16.00) below the theoretical or expected value for the scale (i.e., 31.0).

Therefore, on the basis of the mean scores for the strain scales, the participants report values for physical and psychological strain which are substantially below (a) the expected frequency for physical symptoms of strain and (b) the expected intensity for current psychological symptoms of strain.[C6] In other words, the data implies that the majority of participants do not experience above average levels of physical and psychological strain from the effects of stress (i.e., the transactional imbalance between recognition and expectancy stressors). Further, the positive constriction in the range of responses to the strain scales (i.e., low levels of strain) implies that common and expectancy stressors will not account for high levels of the explained variance in strain.

Skewness values and the observed range of responses for the OSI stressor scales indicate that these scales are essentially normally distributed. By contrast those for the ex-pectancy and strain scales indicate that the expectancy scales are all significantly skewed in the negative direction and those for the strain scales in the positive direction. Therefore, scales with values for skewness greater than 0.604 were transformed to approximate normal distributions using square root transformations of the response distributions.

Cronbach alpha coefficients for the OSI stressor scales indicate that the scales have moderate reliability. Similarly, the alpha coefficients for the stain scales are moderate in nature. However, the 0.76 alpha coefficient for the Physical Strain scale reflects the

[C6] Note: The Composite Strain scale is formed from the Physical and Psychological Strain scales.

removal of three items from the 19 item scale (see note Table C.1, #Scale Range) due to the effect of negative corrected item-total correlations on the reliability of the scale (Norusis, 1988b). Specifically, following the deletion of the minor health items "Coughing" "Colds" and "Flu" from the scale, the internal consistency of the scale increased from $\alpha = 0.74$ to $\alpha = 0.76$. Similarly, the alpha coefficient for the Composite Strain scale (i.e., $\alpha = 0.84$) reflects the deletion of eight Physical Strain scale items from the scale. The items "Falling/Staying asleep" "Irritability" "Tense/Anxious" and Depression" were considered redundant due to their similarity with items in the Psychological Strain scale and thus deleted from the composite scale. In addition, the items "Coughing" "Colds" "Appetite (Hungry)" and "Flu" were deleted from the scale due to the effect of low or negative corrected item-total correlations on the reliability of the scale. However, removing eight items from the scale reduces the reliability of the scale from $\alpha = 0.87$ to $\alpha = 0.84$.

Alpha coefficients for the expectancy scales tend to be low. The average for the scales is 0.61. Furthermore, this indicates that on average errors in measurement (i.e., random and non-random) account for 39.0% of the variance in the response to the expectancy scales. Moreover, the average alpha coefficient indicates that the maximum possible validity for the scales measuring expectancy stressors is only 0.78.

C.4.2.1 Descriptive Comparison Statistics

Table C.2 shows normative descriptive statistics for the OSI stressor scales (Osipow & Spokane, 1883, 1987) and descriptive statistics for the OSI stressor and expectancy scales for both the present study and study one. Descriptive statistics for the Physical, Psychological and Composite Strain scales are not included in the table due to (a) the

use of different response scales for the Psychological Strain scale in the studies and (b) some variability from study to study in the number of items used in the personal Health (i.e., Physical) and Composite Strain scales.

With the exception of the role-overload mean scores, the means for the OSI stressor scales are essentially similar to those for OSI normative data. A Z test of the difference between the role-overload mean scores at α .01 (One Tailed) confirmed the difference between the mean for the present study and (a) study one (i.e., 3.38, Z = 3.2341) and (b) the standardised mean for the scale (i.e., 2.69, Z = 2.4466) as both significantly different.[C7] That is, this sample report the frequency of overload stressors associated with their work (i.e., teaching in a migrant education programme) as significantly more frequent than those reported in the standardised data and in study one.

The expectancy mean scores for the present study are all higher than the expectancy mean scores for study one. Z tests at α .01 (One Tailed) confirmed the difference between the expectancy mean scores as significantly different. For the present sample, then, the expectancy of stress from overload stressors is significantly greater than the expectancy for stress reported by the participants in study one.

With the exception of the OSI Role-Boundary scale, the SD's for the present study and the standardised data are essentially similar. An F test at α 0.01 (One Tailed) confirmed the SD for the Role-Boundary scale normative data (i.e., 8.15) as significantly higher than the SD (i.e., 6.37) for the present study.[C8] Furthermore, the SD's for the present study (mean 6.76) are noticeably wider than those for study one (mean 5.50).

[C7] The formula $Z = y1\text{-}y2/\sqrt{S^2 1/n1+S^2 2/n2}$ at α (One or Two Tailed) provides the basis for a comparison of population means based on sample mean scores (Mendenhall & Ott, 1980, p. 197).

[C8] The formula $F = S^2 1/S^2$ at α (One or Two Tailed) and df (n1-1 & n2-1) enables the comparison of two population variances using sample variances as the basis to calculate F and test the F value against F critical for df n1-1 & n2-1 (Mendenhall & Ott, 1980, p.307).

However, with the exception of the difference between the SD's for the Role-Ambiguity scale (i.e. SD's = 6.75 & 4.58; F = 2.17 ≥ F crit 1.66) the differences are not significant. While for the expectancy scales, the SD's for the present study (mean 2.09) are more narrow than those obtained in study one (mean 2.51). In particular, the SD for the Role-Overload scale (1.51) is significantly less than the reported SD for the Role-Overload scale in study one (i.e., SD = 2.41; F = 2.57 ≥ F crit 1.66).

Table C.2
Comparison Statistics: OSI Stressor and Expectancy Scales

Scale	Studies											
	OSI Normative (n = 549)				Study 1 (n = 148)				Present Study (n = 63)			
	Mean	SD	Skew	α	Mean	SD	Skew	α	Mean	SD	Skew	α
OSI Stressor												
R-Ambiguity	20.28	6.67	----	.78	22.65	4.58	-0.05	.63	22.81	6.75	0.50	.81
R-Boundary	22.67	8.15	----	.82	23.34	5.34	-0.27	.67	23.25	6.37	0.15	.68
R-Overload	25.49	7.79	----	.83	24.80	6.59	0.50	.81	28.18	7.15	0.12	.79
Mean	22.81	7.54		.81	23.60	5.50	0.18	.70	24.75	6.76	0.26	.75
Expectancy												
R-Ambiguity	----	----	----	----	9.33	2.51	-0.28	.76	10.29	2.60	-0.76	.55
R-Boundary	----	----	-----	----	8.89	2.60	-0.52	.72	11.13	2.17	-1.20	.63
R-Overload	----	----	----	----	10.05	2.42	-0.75	.75	12.00	1.51	-0.92	.66
Mean	----	----	----	----	9.42	2.51	-0.52	.74	11.14	2.09	-0.96	.61

Skew values for the OSI stressor scales indicate that the responses to the stressor scales are in essence similar and normally distributed for both the present study and study one. However, as evident from the table, there is no standardised skew data provided by the authors for the OSI stressor scales. By contrast, the skew values for the expectancy scales indicate that the response distributions for each expectancy scale are skewed in the negative direction. In particular, the skew coefficients for the present study indicate that the distributions for the expectancy scales are all significantly

skewed in the negative direction (i.e., skewness ≥ 0.604) . That is, the significant skew values indicate that the responses to the items in the expectancy scales are biased toward the "will cause me stress" pole of the respective response scales.

Cronbach alpha coefficients for the OSI stressor scales tend to be moderate across the studies and generally lower for both the present study and study one. In particular, the alpha coefficients for the Role-Ambiguity scale in study one (0.63) and the Role-Boundary scale in the present study (0.68) and study one (0.67) are noticeably lower than the normative alpha coefficients (0.78 & 0.82) for the respective scales. Seemingly, the context general items used in the ambiguity and boundary scales may require rewording to suit different work populations. Furthermore, the alpha coefficients for the expectancy scales used in the present study tend to be low and those for study one moderate in nature. Those for the present study average a rather low 0.61 and may reflect the underlying effect of the generally lower SD's (i.e., mean 2.09) for the expectancy scales and the significant negative skewness associated with the expectancy scales.

C.4.3 Scale Correlations

Pearson zero-order correlations (n = 63) for the OSI stressor scales and expectancy scales with dimensions of strain are shown in Table C.3; and comparison correlations for the OSI stressor and expectancy original and transformed scales with dimensions of strain in Table C.4. the correlations reflect two-tailed tests for significance at $\alpha \leq$ 0.05* or 0.01** as indicated.

Furthermore, it is important to note that the desired power to detect a medium ES of r = 0.30 at α 0.05 (Two Tailed) cannot be achieved using a sample size n = 63. As the tables for power provided by Cohen (1992) indicate, to detect a medium ES or population r of 0.30 at α 0.05 (Two Tailed) requires a sample size of n = 85 (see Table 2,

p. 158) to achieve a minimum power of 0.80. By contrast, the power of a test for sample size n = 64 and medium ES of 0.30 is a substantially lower 0.68 (see Cohen & Cohen, 1983, Table F.2, p. 529). In other words, for the present study, with a sample size n = 63 the likelihood of making a Type 2 error is increased to 32.0% and the probability of detecting a significant medium ES of r = 0.30 is reduced to 68.0%.

C.4.3.1 OSI Stressor and Expectancy Scale Correlations With Strain

With the notable exception of the Role-Overload scale, the ambiguity and boundary scales show significant correlations with strain. As Table C.3 indicates, the Role-Ambiguity scale correlates 0.27* with the Composite Strain scale and the Role-Boundary scale a much higher and more significant 0.38** with the Physical Strain scale; 0.37** with the Psychological Strain scale; and a higher 0.42** with the Composite Strain scale. Furthermore, with the exception of the moderate 0.57** correlation between the OSI stressor ambiguity and boundary scales, the correlations between the OSI scales are either low or not significant. That is, the correlations indicate that items in the ambiguity or boundary scale may be redundant and the overload scale as essentially independent in nature. The 95% confidence interval for the underlying correlations in the population (i.e., 0.02 to 0.53, sample size n = 50 and observed correlation of r = 0.3) verify the significance of the computed correlations (Skinner, 1884). Furthermore, the correlations between the OSI stressor and expectancy scales are all not significant. As such, the recognition of stressors and the appraisal of stressors in terms of expectancies may be seen as essentially independent in nature, but they both may be significantly related to some other cognitive process or to psychological and physical symptoms of strain.

Table C.3
Correlations: OSI Stressor and Expectancy Scales With Dimensions of Strain

Scale	1	2	3	4	5	6	7	8
Stressor (OSI)								
1. Role-Ambiguity	----							
2. Role-Boundary	.57**	----						
3. Role-Overload	.23	.26*	----					
Expectancy								
4. Role-Ambiguity	.09	.05	-.06	----				
5. Role-Boundary	.11	.06	.06	.56**	----			
6. Role-Overload	-.03	.02	.01	.39**	.29*	----		
Strain								
7. Physical	.21	.38**	.18	.19	.10	.25*	----	
8. Psychological	.24	.37**	.11	.22	.15	.27*	.72**	----
9. Strain Composite*	.27*	.42**	.14	.22	.14	.24	.88**	.95**

Note: n = 63; *p ≤ .05, **p ≤ .01 (two-tail).

With the exception of the low correlations for the Role-Overload scale, the correlations between the expectancy scales and strain are not significant. As the data indicates, The Role-Overload scale correlates a low 0.25* with the Physical Strain scale and a low 0.27* with the Psychological Strain scale. Furthermore, correlations between the expectancy scales are all significant. For instance, the ambiguity scale correlates a moderate 0.56** with the boundary scale and a lower 0.39** with the overload scale. In short, the correlations imply that the expectancy scales may in effect reduce to either one or two stressor dimensions.

Correlations within the strain scales are all high and significant. For instance, the Physical Strain scale correlates 0.72** with the Psychological Strain scale and a higher 0.88** with the Composite Strain scale. That is, the data indicates that a high degree of overlap of the scale items or item redundancy exists within the Physical and Psychological Strain scales. Thus the scales may not be tapping discrete dimensions of strain. Indeed, the Physical Strain scale may be seen as essentially a composite measure of

strain. As a result, the validity of the scale may be somewhat suspect if used as a discrete measure of physical strain. Therefore, items which tap psychological facets of strain should be removed from the scale when it is used in the presence of the Psychological Strain scale; or alternatively, if used for comparative purposes, retained in the measurement model. Furthermore, the high correlations with the Composite Strain scale (i.e., 0.88** & 0.95**) indicate that the composite scale reflects the underlying nature of the Physical and Psychological Strain scales.

C.4.3.2 Original and Transformed Scale Correlations

A comparison of the correlations achieved from the square root transformation of significantly skewed expectancy and strain scales is shown in Table C.4. As the data indicates, the transformation of skewed distributions does not necessarily increase the correlation between variables. For instance, the correlation for the OSI Role-Boundary stressor scale with the transformed Physical Strain scale decreases from 0.38** to 0.33**; with the transformed Psychological Strain scale from 0.37** to 0.32**; and with the transformed Composite Strain scale, from 0.42** to 0.37**. Similarly, the correlations for the original expectancy scales with strain decrease when related to transformed strain scales. For instance, the correlation for the overload scale with the original Composite Strain scale decreases from 0.24 (ns) to 0.22 (ns) when related to the transformed scale.

In contrast to the OSI stressor and original expectancy scales, the correlations for the transformed expectancy scales show an increase in magnitude when correlated with the original and transformed strain scales. In particular, the correlation between the transformed Expectancy Role-Overload scale and transformed Physical Strain scale increases from 0.25* to -0.27*; that for the transformed Role-Boundary scale from 0.25* to -0.27* when correlated with the transformed Psychological Strain scale; and

the transformed expectancy Role-Overload scale from 0.22 (ns) to -0.25* when correlated with the transformed Composite Strain scale. The transformed expectancy stressor and strain scales replaced the skewed expectancy stressor and strain scales in all subsequent regression analyses.

Table C.4
Correlation Comparison: OSI Stressor and Expectancy (Original and Transformed) Stressor Scales With Strain Scales (Original and Transformed)

Stressor Scales	Strain Scales: Physical		Psychological		Composite	
	Orig#	Tran#	Orig	Trans	Orig	Trans
OSI Stressor						
Role-Ambiguity	.21	.17	.24	.21	.27*	.24
Role-Boundary	.38**	.33**	.37**	.32**	.42**	.37**
Role-Overload	.18	.14	.11	.11	.14	.12
Expect Original						
Expect R-Ambig	.19	.14	.22	.14	.22	.17
Expect R-Bound	.10	.09	.15	.13	.14	.13
Expect R-O'Load	.25*	.25*	.27*	.25*	.24	.22
Expect Transformed						
Expect R-Ambig	-.25*	-.20	-.27*	-.20	-.29*	-.23
Expect R-Bound	-.11	-.10	-.15	-.13	-.16	-.15
Expect R-O'load	-.27*	-.27*	-.30*	-.27*	-.27*	-.25*

Note: n = 63; *p ≤ .05, **p ≤ .01 (two-tail); Orig# = Correlation With Original Stressor Scale; Trans# = Correlation With Transformed Stressor Scale

C.4.4 Regression Analyses

Tables C.5 to C.8 summarise the results from a series of backward regression and hierarchical regression models which (a) explore the relative effect of common work stressors (i.e., recognition of common stressors) and expectancy stressors (i.e., expected effect of common work stressors) on composite symptoms of strain; (b) identify the logical importance and test the incremental effect of expectancy stressors when placed in

the presence of common work stressors. Table C.5 depicts the results from baseline models (i.e., backward regression) which explored the effect of common stressors and expectancy stressors on symptoms of strain; Table C.6 the results from a series of backward regression models that explored the relative effect of parallel detection and expectancy stressors (i.e., functional relationship of parallel recognition and appraisal cognitive processes in the presence of each other) on the variance in symptoms of strain; Table C.7 the results from a backward regression model which sought to identify the model of best fit (i.e., most parsimonious explanation for the symptoms of strain reported by the sample) from the relative effect of common and expectancy stressors in the measurement model; and Table C.8, the results from a hierarchical model that sought to identify the theoretical importance and incremental effect of expectancy stressors when placed in the presence of common work stressors. For each regression model, an alpha pout at ≥ 0.051 (Two Tailed) is used to (a) effect the removal of a variable from the regression model or (b) interpret the data in the equations for hierarchical models.

C.4.4.1 Baseline Model Analyses

The results for the baseline models that explored the effect of OSI stressor and stressor expectancy on the explained variance in composite strain are presented in Table C.5. From the effect of the OSI stressors and contrary to the descriptive statistics (i.e., the mean score for the frequency of role-overload stressors was the highest for the OSI scales), only common role-boundary stressors contribute useful information to the explained variance in symptoms of strain. As the table indicates, common role-boundary stressors explained a low 12.31% (adj) of the variance in composite symptoms of strain.

Results for the expectancy baseline model, however, are in accord with the descriptive data for the expectancy scales. That is, the mean score for expectancy overload stressors was the highest for the expectancy scales. As shown in the table, from the effect of expectancy stressors only expectancy role-overload stressors contribute useful information to the explained variance. However, as the data indicates, the expectancy of stress from common role-overload stressors only explained a rather low 4.65% (adj) of the variance in symptoms of strain. Nonetheless, although just significant, there is support for the hypothesis (H1) that, expectancy stressors would explain a significant percentage of the variance in symptoms of strain.

Table C.5
Backward Regression: Baseline Models - Composite Strain on OSI Stressor & Expectancy Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
OSI Stressor Scales	Role-Boundary	13.72%	12.31%	0.3704	3.114	.0028
Mult R=..3704; SE 1.0135; F(1,61) 9.7000, p. 0028						
Expectancy Scales	Role-Overload#	6.18%	4.65%	-0.2486	-2.005	.0494
Mult R=.2487; SE 1.0568; F(1,61) 4.0204, p. 0494						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale; Composite Strain Scale - Transformed Scale.

C.4.4.2 Commensurate Scale Analyses

Table C.6 shows the results from a series of backward regressions that explored the relative effect of commensurate common role-ambiguity, role-boundary and role-overload stressors and the expectancy of common stressors on strain. With respect to role-ambiguity model, neither of the stressor scales contribute useful information to the

explained variance in symptoms of strain. For the role-boundary model, however, the relative effect of common role-boundary stressors explains a low 12.31% (adj) of the variance in strain. Conversely, from the relative effect of role-overload stressors, only the expectancy of role-overload stressors contributes useful information to the explained variance in strain. As the table shows, although just significant (i.e., t = -2.005, signif t = 0.0494), the expectancy of stress from overload stressors explains a low 4.65% (adj) of the variance in strain.

Therefore, on the basis of these results, there is no clear evidence by which to conclude that the recognition of discrete sources of stress has the more significant role in the summation of the imbalance between actual (i.e. recognition of common stressors) and ideal (personal meaning attributed to stressors) work related stressors. The results do show, however, that the personal meaning attributed to specific stressors may, depending on the nature of the stressor, assume the more prominent role in the mental summation of the imbalance between actual and ideal and subsequent symptoms of strain.

Table C.6
Backward Regression: Commensurate Scale Analyses - Composite Strain on Parallel OSI Stressor & Expectancy Scales

Model	Final Equation	Rsq	Rsq (Adj)	Beta	T	Sig T
Role-Ambiguity	Nil Significant	----	----	----	----	----
Role-Boundary	OSI Role-Boundary	13.72%	12.31%	.3704	3.114	.0028
Mult R=.3704; SE 1.0135; F(1,61) 9.6998, p .0028						
Role-Overload	Expect. Role-Overload#	6.18%	4.65%	-.2487	-2.005	.0494
Mult R=.2487; SE 1.0568; F(1,61) 4.0204, p .0494						

Note: Pout, ≥ 0.05; #Transformed Variable; Composite Strain Scale - Transformed Scale.

C.4.4.3 Model of Best Fit

The models of best fit sought to identify the relative effect or significance of common and expectancy stressors on dimensions of strain when in the presence of each other (results for physical and psychological symptoms of strain are shown in Appendix C.6, Table C.9). That is, this analysis sought to identify the model which provides the most parsimonious explanation for the variance in symptoms of strain reported by the sample from the cumulative effect of common and expectancy stressors used in the baseline models. As Table C.7 indicates, the model of best fit for composite strain explained an increased 16.49% (adj) of the variance in symptoms of strain from the relative effect of common role-boundary and expectancy role-overload sources of stress. That is, the solution shows that the expectancy of role-overload stressors (t = -2.015, signif t = 0.0484) adds useful information to the explained variance when in the presence of common role-boundary stressors (t = 3.107, signif t = 0.0029). Further, when compared to the baseline model for common work stressors (see Table C.5), the inclusion of expectancy sources of stress in the model of best fit explains an additional 4.18% (adj) of the variance in strain beyond that explained by common work stressors (i.e., 12.31% adj).

Table C.7
Backward Regression: Model of Best Fit - Composite Strain on OSI Stressor and Expectancy Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
OSI Stressor & Expectancy Scales	OSI Role-Boundary	19.19%	16.49%	0.3609	3.107	.0029
	Expectancy R-Overload#			-0.2340	-2.015	.0484

Mult R=.4380; SE 0.9890; F(2,60) 7.1230, p. 0017

Note: Pout, ≥ .05; #Transformed Variable; Strain Composite Scale - Transformed Scale.

Therefore, on the basis of this result and those for the commensurate scale analyses (see Table C.6), there is support for the hypothesis (H2) that, the relative effect of stressor expectancy contributes useful information to the explained variance when in the presence of common work stressors.

C.4.4.4 Hypothesis Testing

Hierarchical modelling was used to test the hypothesis (H3) that, the incremental effect of stressor expectancy adds significant information to the explained variance when placed in the presence of common work stressors. As Table C.8 shows, the forced entry of the expectancy assigned to role-overload stressors (t = -2.015, signif t = 0.0484) into the presence of common role-boundary stressors adds 5.47% (4.18% adj) to the 13.72% (12.31% adj) explained by the recognition of common role-boundary stressors (t = 3.114, signif t = 0.0028).

Table C.8
Hierarchical Regression: Composite Strain on OSI Stressor and Expectancy Scales

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
	Step 1								
OSI Stressor	R-Boundary	13.72%	12.31%	13.72%	.0028	.3704	.023 - .103	3.114	.0028
Mult R=.3704; SE 1.0135; F(1,61) 9.6998, p. 0028									
	Step 2								
Expectancy	Exp R-O'Load#	19.19%	16.49%	5.47%	.0017	-.2340	-.976 - -.004	-2.015	.0484
Mult R=.4380; SE 0.9890; F(2,60) 7.1230, p. 0017									

Note: Pout, ≥ .05; #Transformed Variable; Strain Composite Scale - Transformed Scale.

Thus, on the basis of this result, the data illustrates that the personal meaning attributed to the expected effects of role-overload stressors contributes both unique and significant information to the explained variance in symptoms of strain when forced into the presence of common work stressors. Furthermore, it confirms the theoretical importance of stressor expectancy in the prediction of strain related outcomes. As a result, there is support for the hypothesis (F3) that the incremental effect of stressor expectancy would contribute significant information to the explained variance when placed in the presence of common work stressors.

C.5 Discussion

The findings of the study illustrate the importance of including the personal meaning imputed to common work stressors in the prediction of strain. In short, the expectancies (i.e., personal meaning) assigned to common work stressors were found to contribute significant information to the explained variance in strain related outcomes. That is, in more specific terms, the expected effect of common role-overload stressors were found to add useful information to the explained variance beyond that explained by the recognition (i.e., description) of common role-boundary stressors. Furthermore, the findings provide some support for the transactional proposition that appraisal and recognition cognitive processes function as both independent and interdependent predictors of symptoms in strain. Further, if these cognitive processes are seen as representing a functional reciprocal relationship, they indicate albeit essentially implicit, that the mental summation of the imbalance between actual (i.e., recognition) and ideal (i.e., expectancy) cognitive processes underpins the translation of stress to strain.

As the results for the independent baseline models show, the recognition of common role-boundary stressors explains 12.31% (adj) of the variance and the expectancy of common role-overload stressors, a somewhat low but significant 4.65% (adj) of the variance in strain (i.e., t = -2.005, signif t = 0.0494). However, when the commensurate measures of common and expectancy sources of work stress are considered in the presence of each other, neither source of work stress is necessarily dominant in the model. For instance, in the role-boundary model, the perceived frequency of common boundary stressors overruled the effect of stressor expectancy and explained 12.31% (adj) of the variance; whereas in the role-overload model, the appraised intensity of stressor expectancy suppressed the effect of common overload stressors and explained a significant 4.65% (adj) of the variance in strain. Therefore, taken together, the data from the commensurate scale analyses would seem to suggest that the personal significance assigned to the stressor (i.e., expectancy) determines the nature and magnitude of the mental imbalance between actual and ideal stressors (Lazarus & Folkman, 1987). Seemingly then, the appraisal of impending threat or the probability of harm from the presence of a common stressor determines both the arousal and priority of information processing (Peacock & Wong, 1990).

Furthermore, the commensurate scale analyses suggest the existence of an operational distinction between the nature and role of acute and chronic stressors in the cognitive processing of stressors (Pratt & Barling, 1988). The reported frequency and significance of role-boundary stressors suggesting that this source of stress for the participants is essentially chronic in nature; and the probability or expected intensity of role-overload stressors, essentially acute in nature. As Pratt and Barling note, chronic stressors are defined as long or short term and frequent in nature; and acute as . . . "severe but of short duration (and) said to involve change" (p. 44). Seemingly, it is logical that

the personal significance (i.e., appraisal of threat) of an impending or impinging acute stressor (e.g., the expectancy of stress from overload demands) is given priority when the person is confronted with an acute source of stress.

Moreover, the significance of the expectancy assigned to overload stressors in the commensurate analyses infer that individual differences in motivation (Lazarus et al. 1952; Lazarus & Folkman, 1987; Vogel, Raymond, & Lazarus, 1959) may well underpin the recognition and appraisal of stressors, that is, it reflects the individual's commitment to a personal value or desired goal (i.e., what's at stake for the individual). As Lazarus & Folkman (1987) argue, people constantly evaluate the significance of impinging events and the possible effect on their well-being. Thus, in terms of appraisal, the fundamental issue at hand for the person: "What does it mean for me personally" (p.145). The resultant question, however, to what extent does the person believe they are able to (a) control or mediate the anticipated effect of the impinging or expected stressor; and (b) adjust to the demands imposed by a stressor (Cox & Ferguson, 1991). For instance, the person's sense of control of impinging or expected events and beliefs about their self-efficacy are known to (a) mediate the perception of threat (i.e., primary appraisal) and (b) moderate their ability to adjust (i.e., secondary appraisal) to a stressor respectively (Folkman & Lazarus, 1985). Similarly, dispositions for hardiness (i.e., the person's sense of control, commitment to life and need for challenge) have been found to both mediate and moderate the relationship between stress and strain outcomes (Cox & Ferguson, 1991). However, as Cox and Ferguson further note, research indicates that the personality dispositions for hardiness and neuroticism (i.e., stability-anxiety continuum) are in effect confounded constructs (see also Gelman, Jory, & Macris, 1998). As

they state, people with low hardiness . . . "may only report more illness because the measure might be correlated with neuroticism, and neurotics tend to report more illness" (p. 17).

The relative significance of personal meaning stressors when in the presence of common work stressors is further evident from the solution for the model of best fit. As the results show, the model explains 16.49% (adj) of the variance in strain from the relative effect of common role-boundary stressors and the expectancies of common role-overload stressors. That is, the cumulative effect of common and expectancy sources of stress explains an additional 4.18% (adj) of the variance beyond that explained by the baseline model for common work stressors (i.e., 12.31% adj). As a result, there is support for the hypothesis (H2) that stressor expectancy would contribute useful information to the explained variance when in the presence of common stressors. In other words, the model shows that the personal meaning assigned to stressors plays a significant role in the nature of the individual's desire (i.e., like more or less) for common work stressors and the subsequent translation of stress to symptoms of strain. Furthermore, it also shows that the frequency of common role-boundary stressors and the intensity of expectancy role-overload stressors provides the most parsimonious explanation for the symptoms of strain reported by the participants.

The logical importance of common stressors and stressor expectancy is further illustrated from the incremental effect of stressor expectancy when placed in the presence of common work stressors. As the data shows, the incremental effect of the expectancy assigned to role-overload stressors adds 4.18% (adj) to the 12.31% (adj) explained by common role-boundary stressors. That is, the solution confirms and identifies the extent to which the personal meaning assigned to stressors contributes useful information to the mental summation of the imbalance between actual and ideal cognitive processes

in the transactional process and the translation of stress to strain. Furthermore, the solution gave support to the hypothesis (H3) that the incremental effect of expectancy stressors would add significant information to the explained variance when placed in the presence of common work stressors.

Perhaps the main surprise from the results was the failure of common role-overload stressors to explain a significant percentage of the variance in strain. As evident from the descriptive data, the magnitude of the perceived frequency of common role-overload stressors was noticeably higher (i.e., mean 28.18) than the frequency for the ambiguity (i.e., mean 22.81) and boundary stressors (i.e., mean 23.25) and the responses to the scale normally distributed. Thus, on this basis, it was logical to expect that common overload stressors would explain a significant percentage of the explained variance in symptoms of strain. However, contrary to expectations, correlations between the overload scale and dimensions of strain were not significant and as a result, the overload scale did not function as a significant predictor of strain.

The result is, however, consistent with transactional view that the objective nature (i.e., magnitude) of a stressor is not necessarily an indicator or precursor to subsequent strain related outcomes (Payne et al., 1988). In other words, the data provides direct support for the view that the personal meaning assigned to common stressors determines (a) the individual's reaction to sources of stress, (b) the stress experience and (c) the explanation of strain related outcomes. However, as evident from the data, there is little to corroborate this view. Although the effect of common role-boundary stressors was the only significant predictor of strain in the baseline model, the expectancy of stress from common role-boundary stressors did not contribute significant information to the explanation of symptoms in strain. By contrast, and consistent with the above

reasoning, although the effect of common role-overload stressors was not significant, the effect of the expectancies assigned to role-overload stressors did explain a significant, albeit small, percentage of the variance in strain.

Seemingly, the common stressor and expectancy scales do not or perhaps are not able to fully capture the nature of the recognition and appraisal cognitive processes underlying the cognitive summation of the transactional imbalance between actual and ideal work demands. The use of a self-report scale that captures the cognitive fusion of the recognition and appraisal cognitive processes involved in the mental summation of the imbalance between actual and ideal stressors would seem to offer a logical approach to the apparent limitations of recognition and expectancy measures (Hobfoll, 1988; Kaplan, 1983). For instance, the use of an evaluative (i.e., imbalance) scale that considers the personal desirability of stressors in terms of "Like More" "About Right" and "Like Less" is theorised to capture the cognitive fusion of recognition and appraisal cognitive processes (see Chapter 2.3.6 & 2.3.7).

Data for the strain scales provides some interesting insight to both the explained variance and the effect of significant skewness in the distribution of the responses to the strain scales. First, the mean scores for the Physical (i.e., 12.03), Psychological (i.e., 8.30) and Composite Strain (i.e., 16.00) scales are all substantially below the expected value for scales with normal distribution and reflects the effect of significant positive skewness for the responses to each of the scales (i.e., skew ≥ 0.604). Indeed, the participants report mean score levels for strain which are noticeably lower than those for study two (i.e., 22.13 & 22.0; 11.46 & 11.36; 28.46 & 28.38 for the respective scales). Similarly, when compared to the OSI normative data (i.e., mean 21.61), the mean score for the Psychological Strain scale is significantly less then the normative mean score

(i.e., diff = 13.31, Z = 15.69).[C9] By contrast, the mean scores for the OSI stressor scales and expectancy scales are all higher than those for study one (see Table C.2) and thus indicate that participants experience high levels of common and expectancy work demands. In actual fact, however, there is seemingly a contradiction between the given data for levels of demand and strain and suggests that participants have, for some unknown reason, in the main, actually understated the frequency of minor health complaints and the intensity of current symptoms of psychological strain. In other words, due to the constriction in the responses to the strain scales, the magnitude of the variance explained by the study is perhaps substantially less than the actual value.

The often substantial effect of significant skewness on the validity of correlations with strain and the variance explained by regression models is evident from differences in the magnitude of correlations with strain and the variance explained by skewed and normally distributed strain scales. For instance, the inflation of the correlation for the OSI Role-Boundary scale with the Composite Strain scale (i.e., r = 0.42**) due to skewness, suggests that role-boundary stressors account for 17.64% of the variance in the Composite Strain scale. However, when the boundary scale is correlated with the transformed Composite Strain scale, the explained variance reduces to 13.69%, that is, a reduction of 3.95% in the variance explained by the correlation. Similarly, for the transformed expectancy scales, the correlation of the ambiguity scale with the transformed Composite Strain scale reduces from a significant -0.29* to -0.23 (i.e., a reduction from 8.41% to 5.29% or 3.12% in the explained variance); and for the overload scale, a reduction from -0.27* to -0.25* (i.e., a reduction from 7.30% to 6.25% or 1.05% in the explained variance) in the correlation between the scales. Therefore, as

[C9] See footnote 7 re the calculation of Z scores and test of the mean difference against Z.

the data indicates (see Table C.4), correlations which are significant when based on skewed distributions (a) may in effect not be significant and (b) the variance explained by the correlation misleading or in essence invalid.

The negative or inflationary effect of significant skewness in the distributions of the strain scales further reflects in the variance explained by multivariate regression models (see Table C.9). As the data indicates, for each regression model, there is a noticeable if not substantial reduction in the explained variance when used with transformed Physical, Psychological and Composite Strain scales. For instance, the variance explained by the expectancy model is reduced from 6.59% (adj) to 4.65% (adj) or 1.94% (adj) when the transformed Composite Strain scale is regressed on the expectancy scales; and for the model of best fit, a more significant reduction from 21.10% (adj) to 16.50% (adj) or 4.6% (adj) when used with the transformed Composite Strain scale.[C10] In other words, the use of strain scales with significant skewness effectively exaggerates or distorts both the independent and relative importance of common and expectancy stressors used in the respective regression models. The findings of regression models based on the use of skewed scales are in effect invalid and therefore serve no useful purpose in stress research which seeks to progress the understanding of the transactional process underlying stress and the translation to symptoms of strain.

In summary, the findings of this study show that the prediction of strain within a nomothetic framework can be significantly improved by the inclusion of expectancies (i.e., the personal meaning imputed to common work stressors) in the presence of common work stressors. That is, the study has shown that the appraisal of common work stressors in terms of expectancy contributes useful information to the explanation of symptoms in strain.

[C10] Note: Due to low power (i.e., < 0.8) from sample size n = 63, it is not valid to test the difference in R^2 against Z. (see Chapter 3.2.2.5.4.3).

Furthermore, the findings of the present study tend to replicate those from studies one and two. In study one, the relative effect of expectancy stressors added 4.91% (adj) to the 29.67 % (adj) explained by common work stressors; for study two, expectancies added a reduced 3.42% (adj) to the 20.54% (adj) explained by common study stressors; while for the present study, the expectancy of stress from common role-overload stressors added 4.18% (adj) to the 12.31% (adj) explained by common role-boundary stressors. Thus, across the three studies, when placed in the presence of common stressors, the relative effect of expectancies on average accounts for a low but significant 4.17% (adj) of the explained variance in symptoms of strain. In other words, the data suggests that the rather limited but significant contribution of expectancy appraisals to the explained variance has both theoretical and heuristic value but perhaps minimal practical value in applied settings.

Nonetheless, the consistency in the effect of expectancies does provide some support for the transactional proposition, albeit rather small and implicit, that expectancy appraisals play a both functional and determining role in the appraisal of the imbalance between recognition (i.e., actual) and appraisal (i.e., ideal) cognitive processes and the subsequent intensity of stress outcomes (Folkman & Lazarus, 1985; Lazarus & Folkman 1987). For example, graphical and correlational data from study two suggest that expectancies and the moderating effect of individual differences underpin the personal valence (i.e., attractiveness) attributed to common stressors. As a result, there is the inference of a cognitive fusion of the relatively discrete and more specific expectancy and valence appraisal processes into a more economical, holistic and thus higher order appraisal process (James & Jones, 1980).

Therefore, given the limited contribution of expectancy appraisals to the explained variance, it may be concluded that measures of expectancies do not enable a more parsimonious approach to the explanation of strain. Hence, they would seem to have limited use as predictors of strain. They may, however, still have theoretical value in the measurement model. Thus, based on the assumption that evaluative appraisals (i.e., the desirability of common work stressors) are essentially a higher order amalgam of expectancy and valence appraisals, it is likely that lower-order appraisal processes will reflect a significant correlation with the evaluative cognitive process. Consequently, to verify the theoretical structure of desirability evaluations, research will need to explore the cognitive structure of evaluative information processing. That is, it will be necessary to explore both the correlation with recognition, expectancy, and valence cognitive processes and the prediction of evaluative appraisals using these lower-order cognitive processes.

Directions for future research should follow three directions. First, although the expectancies of common work stressors are generally poor predictors of strain, they in effect represent only one domain of the expectancies associated with work. It may be the case, that expectancies related to social and self-efficacy demands may also function as significant predictors of strain. For instance (a) the provision of social support (Hobfoll, 1988) and (b) the persons appraisal of their ability to maintain their work performance when confronted with minor physical and psychological health complaints (Bandura, 1977; Sutherland & Cooper, 1988) are likely to explain additional variance in strain.

Second, taken across the studies, variations in the variability (i.e., SD's) of the responses to the recognition and expectancy scales and the significant effect of expectancies on the explained variance, suggests that individual differences in motivation (i.e.,

what's at stake for the individual) may well moderate the recognition and appraisal of common work stressors. In particular, there is the inference from the expectancy data, that individual differences in personal resilience (Antonovsky, 1991; Bandura, 1977) or dispositions for hardiness (Kobasa, 1979) may in effect underpin the recognition and expectancy of common work stressors. However, there is also some evidence which indicates that hardiness and neuroticism personality characteristic (i.e., cognitive styles) might be confounded dispositions underlying the stressor to strain relationship (Cox & Ferguson, 1991). That is, there may be an inverse relationship between these personality dispositions and strain: those with high neuroticism and low hardiness may tend to report higher levels of strain. Therefore, to clarify the nature of the relationships and relative effect of these dispositions on strain, future research should further explore (a) the correlation of hardiness and neuroticism with common stressors, the expectancy of common stressors and dimensions of strain; and (b) the main and moderating effect of both neuroticism and hardiness on symptoms of strain

The third, considering the apparent limitations or limited utility of the expectancy and valence related to common stressors, future studies should move to explore the relative effect of higher-order cognitive processes on the explained variance. As discussed above, the appraisal of common stressors in terms of their personal desirability is considered to enable a more holistic insight to the nature of the transactional process underlying the stress to strain relationship. The use of an evaluative response scale which taps the desirability of stressors using a "like more - like less" bipolar frame of reference moves the focus of measurement to one which is expected to capture more of the overlap between recognition and appraisal cognitive process and thereby explain more of the variance in symptoms of strain.

C.6 Models of Best Fit: Physical and Psychological Strain

Table C.9 depicts the results from a backward regression model which sought to identify the models of best fit for physical and psychological strain. As the results show, the cumulative effect of common role-boundary and expectancy role-overload stressors explain a moderate 14.35% and 14.30% of the variance in strain respectively. The inclusion of expectancy role-overload stressors in the physical strain model adds 5.2% (adj) to the variance explained by common role-boundary stressors (i.e., 9.15% adj); and similarly from its inclusion in the psychological strain model, 5.4% (adj) to the variance explained by common role-boundary stressors (i.e., 8.93% adj).

Table C.9
Backward Regression: Model of Best Fit - Physical and Psychological Strain on OSI Stressor and Expectancy Stressor Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Physical Strain						
OSI Stressor & Expectancy Stressors	OSI Role-Boundary	17.11%	14.35%	.3155	2.682	.0094
	Expectancy R-Overload#			-.2551	-2.168	.0341
Mult R=.4137; SE 0.8020; F(2,60) 6.1931, p. 0036						
Psych Strain						
OSI Stressor & Expectancy Stressors	OSI Role-Boundary	17.06%	14.30%	.3120	2.652	.0102
	Expectancy R-Overload#			-.2583	-2.195	.0320
Mult R=.4130; SE 0.9764; F(2,60) 6.1717, p. 0037						

Note: pout, ≥ .05; #Transformed Variable; Physical and Psychological Strain Scales - Transformed Scales.

C.7 Strain Scale Evaluations

Table C.10 compares the ability of original and transformed Physical, Psychological and Composite Strain scales to capture the translative effects (i.e., translation of stress to strain) of common work stressors and expectancy work stressors. As the data indi-

cates, in terms of relative efficiency, the Composite Strain (transformed) scale generally provides the more effective approach by which to capture symptoms of strain from the relational effect of common and expectancy work stressors. For instance, when used with the OSI stressor scales it explains 12.31% (adj) of the variance in strain; with the expectancy scales, a much lower 4.65% (adj) of the variance; and with the model of best fit, an increased 16.50% (adj) of the variance in strain.

However, as further evident from the table, significant skewness in the response distribution for each strain scale acts to inflate or exaggerate the relationship between stressors and dimensions of strain. In each case, there are reductions in the explained variance, some substantial, when transformed strain scales are used in the regression model. Therefore, the results from models using strain scales with significant skew may in effect be somewhat misleading if not invalid. For instance, from the results for the model of best fit, the variance explained by the Physical Strain scale (i.e., 18.67% adj) decreases by 4.32% (adj) to 14.35% (adj) when replaced with the transformed Physical Strain scale; those for the transformed Psychological Strain scale, a decrease of 4.89% in the explained variance (adj) from 19.19% (adj) to 14.30% (adj); and those for the transformed Composite Strain scale, a decrease of 4.6% (adj) from 21.10% (adj) to 16.50% (adj) in the variance explained by the model.

When seen in proportional terms, however, the transformed Psychological Strain scale provides the more efficient approach to the measurement of symptoms of strain. For instance, for the model of best fit, the ten item Psychological Strain scale explains 1.43% (adj) of the variance per item from the effect of common role-boundary and expectancy role-overload stressors; the 16 item Physical Strain scale a reduced 0.90% of the variance per item; and the 21 item Composite Strain scale, a lower 0.79% of the

variance in strain per item. Therefore, in terms of efficiency, the Psychological Strain scale provides the more specific and parsimonious approach to the measurement of symptoms in strain. Moreover, in terms of relative effectiveness, the variance explained by the Psychological Strain scale (i.e., 14.30) is comparable to the ability of the physical scale (i.e., 14.35%) and marginally lower than the 16.50% (adj) explained by the Composite Strain scale.

However, when the results are seen in terms of conceptual understanding, the Composite Strain scale provides (a) the more valid, specific and versatile approach to the measurement of symptoms of strain and (b) the more instructive insight to the negative effects or relationship of common and expectancy work stressors with symptoms of strain. As indicted by the data, the inclusion of the physical strain items from the Physical Strain scale with the items in the Psychological Strain scale enables the Composite Strain scale to explain an additional 2.2% (adj) of the variance in symptoms of strain.[C11] Furthermore, if there is a need to explore the linkage between stressors and facets of strain, it is possible to extract discrete measures of psychological and physical strain from the Composite Strain scale.

[C11] Note: When combined with Psychological Strain scale, the deletion of eight items from the Physical Strain scale (see 4.3.4.2) changes the face validity of the scale to essentially a measure of physical strain.

Table C.10
Strain Scale Evaluations: Original and Transformed Physical, Psychological and Composite Strain Scales.

Strain Scales	Role-Stressor Models (Backward Analyses)					
	OSI Stressor Scales		Expectancy Scales		Model of Best Fit	
	Final Model+	Rsqr (Adj)	Final Model+	Rsqr (Adj)	Final Model+	Rsqr (Adj)
Physical (16 Items)	Role-Boundary	13.36%	Role- Overload#	5.82%	OSI Role-Boundary Expect. Role-O'Load#	18.67%
Physical (Transformed)	Role-Boundary	9.15%	Role- Overload#	5.65%	OSI Role-Boundary Expect. Role-O'Load#	14.35%
Psychological (10 Items)	Role-Boundary	11.80%	Role- Overload#	7.76%	OSI Role-Boundary Expect. Role-O'Load#	19.19%
Psychological (Transformed)	Role-Boundary	8.93%	Role Overload#	5.82%	OSI Role-Boundary Expect. Role-O'Load#	14.30%
Composite Strain (21 Items)	Role-Boundary	15.82%	Role-Ambiguity#	6.59%	OSI Role-Boundary Expect. Role-Ambig#	21.10%
Composite Strain (Transformed)	Role-Boundary	12.31%	Role-Overload#	4.65%	OSI Role-Boundary Expect. Role-O'Load#	16.50%

Note: 1) Final Model+: (a) Prob of t Value ≤.05; (b) Shown in Order of Significance; (c) #Transformed Scale. 2) Variables in the Model: (a) OSI Stressor Model - Three OSI Stressor Scales; (b) Expectancy Model - Three Expectancy Scales; (c) Model of Best Fit - Three OSI Stressor Scales and Three Expectancy Stressor Scales.

Appendix C.8

Sources of Work Stress Survey

University of Wollongong: Department of Psychology

Sources of Work Stress Survey

PARTICIPANT INFORMATION AND CONSENT FORM

This study will be conducted by Rudi Stockling in order to satisfy the research project component of a Master of Science (Pass) degree in Psychology at the University of Wollongong under the supervision of Dr. Peter Smith, Telephone (0 42) 21 40 70.

The purpose of the study is to investigate teachers' perception of stress related to the teaching of English to students of non-English speaking background.

The study involves the completion of a questionnaire related to job stress and general stress level.

The results of the study will be made available to interested participants. Please leave your name and address at the bottom of this sheet if you would like information on the outcome of the study and return the sheet separate from your completed questionnaire.

Participation in the study is entirely voluntary and participants are under no obligation to, complete the questionnaire. No names or identifying data are collected.

If you have any further questions concerning the research, please contact me on (04) 287200 (work) or on (048)894332 (home).

I thank you for your participation

Rudi Stockling,
Department of Psychology
University of Wollongong

Yes, I would like to be informed about the result of the study:

Name:.....

Address:.....
.....
.....
.....
.....

Tear of and return to Rudi Stockling or send to:
Rudi Stockling
I Daphne Street
Colo Vale 2575

1. Role Conflict & Role Boundary:

The extent to which you are confronted with conflicting demands and/or an unclear chain of commands .

	Tick where appropriate
1) I am not affected by conflicting demands.	
2) I am rarely affected by conflicting demands.	
3) I am occasionally affected by conflicting demands.	
4) I am often affected by conflicting demands.	
5) I am always affected by conflicting demands.	

Give an example of a situation where you were affected by conflicting

demands:.....

.....

.....

.....

2. Role Ambiguity:

The extent to which you do not clearly understand what is expected of you to accomplish the job.

	Tick where appropriate
1) I am never unclear about what is expected of me.	
2) I am rarely unclear about what is expected of me.	
3) I am occasionally unclear about what is expected of me.	
4) I am often unclear about what is expected of me.	
5) I am always unclear about what is expected of me.	

Give an example of a situation where you were unclear about what was

expected of you .....

.....

.....

.....

3. Role Overload (Quantitative):

The extent to which the volume of work exceeds your ability to accomplish it in the allocated time.

	Tick where appropriate
1) The volume of work never exceeds my ability to accomplish it in the allocated time.	
2) The volume of work rarely exceeds my ability to accomplish it in the allocated time.	
3) The volume of work occasionally exceeds my ability to accomplish it in the allocated time.	
4) The volume of work often exceeds my ability to accomplish it in the allocated time.	
5) The volume of work always exceeds my ability to accomplish it in the allocated time.	

Give an example of a situation where the volume of work exceeded your ability to accomplish it in the allocated time.....

.....

.....

.....

4. Role Overload (Qualitative):

The extent to which job demands exceed your level of training, education and skills.

	Tick where appropriate
1) Job demands never exceed my level of training, education and skills.	
2) Job demands rarely exceed my level of training, education and skills.	
3) Job demands occasionally exceed my level of training, education and skills.	
4) Job demands often exceed my level of training, education and skills.	
5) Job demands always exceed my level of training, education and skills.	

Give an example of a situation where job demands exceed your level of

training, education and skills.....

.....

.....

.....

5. Responsibility

The extent to which you feel responsible for the welfare and performance of other employees.

	Tick where appropriate
1) I never feel responsible for the welfare and performance of other employees.	
2) I rarely feel responsible for the welfare and performance of other employees	
3) I occasionally feel responsible for the welfare and performance of other employees	
4) I often feel responsible for the welfare and performance of other employees	
5) I always feel responsible for the welfare and performance of other employees	

Give an example of a situation where you felt responsible for the welfare and performance of other employees .....

.....

.....

.....

6. Physical Environment

The extent to which you work in a physical environment that is inadequate

	Tick where appropriate
1) I never work in a physical environment that is inadequate.	
2) I rarely work in a physical environment that is inadequate.	
3) I occasionally work in a physical environment that is inadequate.	
4) I often work in a physical environment that is inadequate.	
5) I always work in a physical environment that is inadequate.	

Give an example of a situation when you worked in a physical environment that is inadequate.....

.....

.....

.....

7. Politics

The extent to which politics (rather than job necessities) affect organisational decisions.

	Tick where appropriate
1) Politics never affect organisational decisions.	
2) Politics rarely affect organisational decisions	
3) Politics occasionally affect organisational decisions	
4) Politics often affect organisational decisions	
5) Politics always affect organisational decisions	

Give an example of a situation where politics (rather than job necessities) affected organisational decisions.....

.....

.....

.....

8. Professional Development:

The extent to which a lack of training and development opportunities affects you.

	Tick where appropriate
1) A lack of training and development opportunities never affects me.	
2) A lack of training and development opportunities rarely affects me.	
3) A lack of training and development opportunities occasionally affects me.	
4) A lack of training and development opportunities often affects me.	
5) A lack of training and development opportunities always affects me.	

Give an example of a situation where a lack of training and development opportunities affected you .....

.....

.....

.....

9. Rewards

The extent to which lack of reward for job performance affects you.

	Tick where appropriate
1) A lack of reward for job performance never affects me.	
2) A lack of reward for job performance never affects me.	
3) A lack of reward for job performance never affects me.	
4) A lack of reward for job performance never affects me.	
5) A lack of reward for job performance never affects me.	

Give an example of a situation where a lack of reward for job performance affected you.....

.....

.....

.....

10. Participation

The extent to which you feel that your input into management decisions is not acted upon.

.

	Tick where appropriate
1) I never feel that my input into management decisions is not acted upon.	
2) I rarely feel that my input into management decisions is not acted upon.	
3) I occasionally feel that my input into management decisions is not acted upon.	
4) I often feel that my input into management decisions is not acted upon.	
5) I always feel that my input into management decisions is not acted upon.	

Give an example of a situation where your input into management

decisions is not acted upon. .....

.....

.....

.....

11. Underutilization (Role Insufficiency)

The extent to which you feel that the job you are given does not utilise your skills and abilities.

.

	Tick where appropriate
1) I never feel that the job I am given does not utilise my skills and abilities	
2) I rarely feel that the job I am given does not utilise my skills and abilities	
3) I occasionally feel that the job I am given does not utilise my skills and abilities	
4) I often feel that the job I am given does not utilise my skills and abilities	
5) I always feel that the job I am given does not utilise my skills and abilities	

Give an example of a situation where the job you are given does

not utilise your skills and abilities .....

.....

.....

.....

12. Organizational Management

The extent to which you feel that the supervision you receive and/or the communication within the organization is adequate.

	Tick where appropriate
1) I never feel that the supervision I receive and/or the communication within the organization is inadequate	
2) I rarely feel that the supervision I receive and/or the communication within the organization is inadequate	
3) I occasionally feel that the supervision I receive and/or the communication within the organization is inadequate	
4) I often feel that the supervision I receive and/or the communication within the organization is inadequate	
5) I always feel that the supervision I receive and/or the communication within the organization is inadequate	

Give an example of a situation where the supervision you received and/or the communication within the organization was inadequate.....

.....

.....

.....

13. Organizational Structure

The extent to which you feel that the structure and/or command chains in your organization are counterproductive.

	Tick where appropriate
1) I never feel that the structure and/or command chains in my organization are counterproductive.	
2) I rarely feel that the structure and/or command chains in my organization are counterproductive.	
3) I occasionally feel that the structure and/or command chains in my organization are counterproductive.	
4) I often feel that the structure and/or command chains in my organization are counterproductive.	
5) I always feel that the structure and/or command chains in my organization are counterproductive.	

Give an example of a situation where the structure and/or command

chains in your organization were counterproductive .....

.....

.....

.....

14. Resource Adequacy

The extent to which you feel that teaching resources are inadequate.

	Tick where appropriate
1) I never feel that teaching resources are inadequate.	
2) I rarely feel that teaching resources are inadequate.	
3) I occasionally feel that teaching resources are inadequate.	
4) I often feel that teaching resources are inadequate.	
5) I always feel that teaching resources are inadequate.	

Give an example of a situation where teaching resources were

inadequate.....

.....

.....

.....

15. Client (Student) Problems

The extent to which you feel inadequately equipped to deal with the personal problems presented by clients.

.

	Tick where appropriate
1) I never feel inadequately equipped to deal with the personal problems presented by clients.	
2) I rarely feel inadequately equipped to deal with the personal problems presented by clients.	
3) I occasionally feel inadequately equipped to deal with the personal problems presented by clients.	
4) I often feel inadequately equipped to deal with the personal problems presented by clients.	
5) I always feel inadequately equipped to deal with the personal problems presented by clients.	

Give an example of a situation where you felt inadequately equipped to

deal with the personal problems presented by clients.....

.....

.....

.....

16. Future Uncertainty (General)

The extent to which you feel uncertain how organisational restructuring will affect you.

.

	Tick where appropriate
1) I never feel uncertain how organisational restructuring will affect me.	
2) I rarely feel uncertain how organisational restructuring will affect me.	
3) I occasionally feel uncertain how organisational restructuring will affect me.	
4) I rarely feel uncertain how organisational restructuring will affect me.	
5) I rarely feel uncertain how organisational restructuring will affect me.	

Give an example of a situation where you felt uncertain how organisational

restructuring would affect you .....

.....

.....

.....

17. Future Uncertainty (Personal)

The extent to which you feel uncertain about job security.

.

	Tick where appropriate
1) I never feel uncertain about job security.	
2) I rarely feel uncertain about job security.	
3) I occasionally feel uncertain about job security.	
4) I often feel uncertain about job security.	
5) I always feel uncertain about job security.	

Give an example of a situation where you felt uncertain about

job security.....

.....

.....

.....

18. Social Support and Loyalty Conflicts

The extent to which you feel unsupported by other teachers and/or the extent to which you experience conflicting loyalty demands.

	Tick where appropriate
1) I never feel unsupported by other teachers and/or the extent to which you experience conflicting loyalty demands.	
2) I rarely feel unsupported by other teachers and/or the extent to which you experience conflicting loyalty demands.	
3) I occasionally feel unsupported by other teachers and/or the extent to which you experience conflicting loyalty demands.	
4) I often feel unsupported by other teachers and/or the extent to which you experience conflicting loyalty demands.	
5) I always feel unsupported by other teachers and/or the extent to which you experience conflicting loyalty demands.	

Give an example of a situation where you felt unsupported by other teachers

and/or the extent to which you experience conflicting loyalty demands.....

.....

.....

.....

19. Career Progress

The extent to which you feel that your opportunities for professional advancement are inadequate or restricted.

.

	Tick where appropriate
1) I never feel that my opportunities for professional advancement are inadequate or restricted.	
2) I rarely feel that my opportunities for professional advancement are inadequate or restricted.	
3) I occasionally feel that my opportunities for professional advancement are inadequate or restricted	
4) I often feel that my opportunities for professional advancement are inadequate or restricted.	
5) I always feel that my opportunities for professional advancement are inadequate or restricted.	

Give an example of a situation where you felt that your opportunities for professional advancement were inadequate or restricted.....

.....

.....

.....

20. Job Scope

The extent to which you feel that your job is too demanding for you to perform with proficiency.

	Tick where appropriate
1) I never feel that my job is too demanding for me to perform with proficiency.	
2) I rarely feel that my job is too demanding for me to perform with proficiency.	
3) I occasionally feel that my job is too demanding for me to perform with proficiency.	
4) I often feel that my job is too demanding for me to perform with proficiency.	
5) I always feel that my job is too demanding for me to perform with proficiency.	

Give an example of a situation where you felt that your job was too demanding

for you to perform with proficiency.....

.....

.....

.....

Appendix C.9

Stress in Teaching Survey

University of Wollongong: Department of Psychology

Stress in Teaching Survey

Stress related to the teaching of English to students of non-English-speaking background

PARTICIPANT INFORMATION AND CONSENT FORM

This study will be conducted by Rudi Stockling in order to satisfy the research project component of a Master of Science (Pass) degree in Psychology at the University of Wollongong under the supervision of Dr. Peter Smith, Telephone (0 42) 21 40 70.

The purpose of the study is to investigate teachers' perception of stress related to the teaching of English to students of non-English speaking background.
The study involves the completion of a questionnaire related to job stress and general stress level.

The results of the study will be made available to interested participants. Please leave your name and address at the bottom of this sheet if you would like information on the outcome of the study and return the sheet separate from your completed questionnaire.

Participation in the study is entirely voluntary and participants are under no obligation to, complete the questionnaire. No names or identifying data are collected.

If you have any further questions concerning the research, please contact me on (04) 287200 (work) or on (048)894332 (home).

I thank you for your participation

Rudi Stockling,
Department of Psychology
University of Wollongong

Yes, I would like to be informed about the result of the study:

Name:.....

Address:.....
.....
.....
.....

Tear off and return to Rudi Stockling or send to:
Rudi Stockling
I Daphne Street
Colo Vale 2575

Appendix C.9.1

Work Beliefs Scale

Please Read Before Answering

Work Beliefs Scale

(After Osipow, S. H., & Spokane, A. R., 1983)

Each of us believes that there are aspects of our job that will cause us stress when at work.

For example, some people believe that a consistent background noise at work will most certainly cause them stress while others believe it will most certainly not cause them to feel stress.

On the next page, a number of statements about work are made. We do not want to know for the moment if these statements apply to your work situation or not. Rather, we would like to know how likely it is in your belief that each of these features of work will or will not cause you stress at work. Please read each item and circle the scale according to the extent they will, in your opinion, cause you stress.

If for example you believe that a consistent background noise at work will certainly cause stress then you would circle the +2 on the scale. If you believe that it is very unlikely that it will cause stress you circle the -2 on the scale.

Remember

+3	+2	+1	0	-1	-2	-3
Most certainly will	Normally will	Sometimes will	Not sure	Unlikely	Very unlikely	Most certainly will not

---

Please Circle

1. Job demands exceeding my personal and company resources will cause me stress.	+3	+2	+1	0	-1	-2	-3
2. Being unable to accomplish the workload expected of me will cause me stress.	+3	+2	+1	0	-1	-2	-3
3. Being uncertain of what is expected of me at work will cause me stress.	+3	+2	+1	0	-1	-2	-3
4. Having no clear sense of what I need to achieve in order to be promoted will cause me stress.	+3	+2	+1	0	-1	-2	-3
5. My supervisors having conflicting ideas about what my job requires will cause me stress.	+3	+2	+1	0	-1	-2	-3
6. Having conflicting loyalties at work will cause me stress.	+3	+2	+1	0	-1	-2	-3

Appendix C.9.2

Occupational Environment Scale (OES)

Please Read Before Answering

Occupational Environment Scale

The following scale is called the Occupational Environment Scale. It is designed to measure different kinds of stress people experience in their work. On the answer column you notice that 5 stands for most of the time and 1 stands for rarely. Notice that responses 2, 3 and 4 also have a descriptive label. Read each statement and circle whichever of the five responses seems to **fit best your *present* work situation**. Please be sure to respond to all 30 items, but do not spend much time thinking about the answer, we want your first, immediate response.

Remember

5	4	3	2	1
Most of the time	Usually	Often	Occasionally	Rarely or never

	Please circle				
1. At work I am expected to do too many different tasks in too little time	5	4	3	2	1
2. I feel that my job responsibilities are increasing.	5	4	3	2	1
3. I am expected to perform tasks on my job for which I have never been trained.	5	4	3	2	1
4. I have to take work home with me.	5	4	3	2	1
5. I have the resources I need to get my job done.	5	4	3	2	1
6. I feel competent in what I do.	5	4	3	2	1
7. I work under tight time deadlines.	5	4	3	2	1
8. I wish that I had more time to deal with the demands placed upon me at work.	5	4	3	2	1
9. My job requires me to work in several equally important areas at once.	5	4	3	2	1
10. I am expected to do more work than is reasonable.	5	4	3	2	1
11. My supervisor provides me with useful feedback about my performance.	5	4	3	2	1
12. It is clear to me what I have to do to get ahead	5	4	3	2	1
13. I am uncertain about what I am supposed to do/accomplish in my work.	5	4	3	2	1

Remember

5	4	3	2	1
Most of the time	Usually	Often	Occasionally	Rarely or never

Please circle

14. When faced with several tasks I know which should be done first.	5	4	3	2	1
15. I know where to begin a new project when it is assigned to me.	5	4	3	2	1
16. My supervisor asks for one thing, but really wants another.	5	4	3	2	1
17. I understand what is acceptable personal behaviour on the job (e.g. dress, interpersonal relations etc.).	5	4	3	2	1
18. The priorities of my job are clear to me.	5	4	3	2	1
19. I have a clear understanding of how my boss wants me to spend my time.	5	4	3	2	1
20. I know the basis on which I am evaluated.	5	4	3	2	1
21. I feel conflict between what my employer expects me to do and what I think is right or proper.	5	4	3	2	1
22. I feel caught between factions at work	5	4	3	2	1
23. I have more than one person telling me what to	5	4	3	2	1
24. I feel I have a stake in the success of my employer (or enterprise).	5	4	3	2	1
25. I feel good about the work I do.	5	4	3	2	1
26. My supervisors have conflicting ideas about what I should be doing.	5	4	3	2	1
27. I am proud of what I do for a living.	5	4	3	2	1
28. It is clear who really runs things where I work.	5	4	3	2	1
29. I have divided loyalties on my job.	5	4	3	2	1
30. The work I do has as much payoff for me as for my employer.	5	4	3	2	1

Appendix C.9.3

Personal Health Scale

Personal Health Scale

(After Osipow, S. H., & Spokane, A. R., 1983; Smith, P., & Bennett, 1983)

The next questions are about your general health. Please answer how often you suffer from each problem mentioned.

	Please Circle		
	Yes	Sometimes	No
1. Stomach upsets	3	2	1
2. Weight gain	3	2	1
3. Eyestrain	3	2	1
4. Coughing	3	2	1
5. Tiredness	3	2	1
6. Eat wrong foods	3	2	1
7. Uninterested	3	2	1
8. Falling asleep	3	2	1
9. Irritability	3	2	1
10. Colds	3	2	1
11. Excess drinking	3	2	1
12. Tense/anxious	3	2	1
13. Aches/Pains	3	2	1
14. Appetite (Hungry)	3	2	1
15. Indigestion	3	2	1
16. Depression	3	2	1
17. Flu	3	2	1
18. Loss of appetite	3	2	1
19. Lethargic (Drowsy)	3	2	1

Appendix C.9.4

Psychological Strain Scale

Psychological Strain Scale

Finally we ask some questions about your feelings and your mood at present. Please remember that your answers are completely anonymous.

	Please Circle		
	Yes	Sometimes	No
1. Lately, I am easily irritated.	3	2	1
2. Lately, I have been depressed.	3	2	1
3. Lately, I have been feeling anxious	3	2	1
4. I have been feeling happy lately	3	2	1
5. So many thoughts run through my head at night that I have trouble falling asleep	3	2	1
6. Lately I respond badly in situations that normally wouldn't bother me	3	2	1
7. I find myself complaining about little things	3	2	1
8. Lately, I have been worrying	3	2	1
9. I have a good sense of humour	3	2	1
10. Things are going about as they should	3	2	1

I would like to thank you very much for having completed the questionnaire. Please leave your name and address on the first page if you would like to be informed about the outcome of the study.

Appendix D

Study 4

D.1 Results

D.1.1 Descriptive Statistics

Descriptive statistics for n = 132 are shown in Table D.1. With the noticeable exception of the SDS Overload Qualitative stressor scale, the mean scores and SD's for the two item SDS stressor scales are essentially similar. The lower mean score for the Overload Qualitative scale (i.e., 1.598) reflecting (a) the more narrow SD for the scale (i.e., 1.445) and (b) the significant positive skewness (i.e., $0.794 \geq 0.422$) in the responses to this scale. That is, the responses to the scale are skewed toward the low end of the response scale and in contradiction of the items "The work quality standards are unrealistic" and "I can't do a good job with my present skills and abilities". In other words, approximately 68.0% of the participants perceive (a) work standards as by and large realistic and (b) that they are able to do a good job with their present skills and abilities.

Coping Scales

The magnitude of the mean scores for the coping scales are noticeably different and suggest both distinct and ordinal preferences in the relative effectiveness of the nomothetic (i.e., global) coping strategies used by this sample. By contrast, the SD's for the scales are essentially similar and suggest consistent variability in the range of responses to the coping scales.

Further, when the mean scores for coping are seen in terms of ascendancy, the data would seem to suggest that the participants have an ordinal preference for the use Physical (i.e., 11.280), recreational (i.e., 15.417), rational/cognitive (i.e., 18.864) and social support (i.e., 24.227) strategies to cope with stress. That is, the use of physical coping is, it would seem, the least preferred coping strategy used by the sample to counteract stress; and conversely, the utility of social support coping, the most frequent

strategy used by the sample to cope with stress. The tendency to use social support coping further reflects in the high negative and significant skewness (i.e., -1.371 or 4.5 SE's > 0.422) of the responses to the social support items. Specifically, if related to social support scores above the mean, 82 or 62.12% of the participants are more frequently reliant on the use of social support coping than those at or below the mean frequency for social support coping.

Belief and Expectancy Scales

The mean score for the five item Belief Social Support scale (i.e., 4.879) is less than the five item Expectancies Psychological Stress scale (i.e., 5.985) and reflects the significant posive skewness (i.e., 0.656 ≥ 0.422) of the responses to this scale. Indeed, the responses to the scale tend to gather toward the low end of the scale and indicate that 97 (i.e., 73.5%) of the participants (i.e., those with scores < 7) believe that the provision of social support is not seen as a source of personal demand. Similarly, the significant positive skewness in the response to the expectancies for psychological stress (i.e, 0.551 ≥ 0.442) suggest that for the majority of participants, the expected effect of symptoms of psychological strain will unlikely influence either their relationships at work or job performance. By contrast, the mean score for the three item Expectany General Health scale (i.e., 4.333) approximates that expected for a normal distribution (i.e., 4.5 for range 0 - 9) and the responses to the scale items normally distributed (i.e., skew = 0.271). This indicates that participants expect the effect of physical strain will more likely influence their work relationships and work performance than the expected effect of psychological strain.

Table D.1
Descriptive Statistics: Stressor, Coping, Belief, Expectancy, Neuroticism and Strain Scales

Scale	Mean	SD	Scale Range+	Observed Range	Skew	Tran/Var Skew++	Alpha
Stressor							
Rewards	3.273	1.911	----	0 - 6	-0.131	----	.3750
Participation	3.159	1.601	----	0 - 6	-0.003	----	-.0137
Underutilisation	2.636	1.691	----	0 - 6	0.598	0.277	.5001
Supervisory Style	2.964	1.542	----	0 - 6	0.410	0.050	.0658
Role-Ambiguity	2.030	1.760	----	0 - 6	0.644	0.286	.2311
Role-Conflict	3.076	1.960	0 - 6	0 - 6	0.164	----	.3750
Overload Quantitative	2.152	1.916	----	0 - 6	0.792	-0.220	.5976
Overload Qualitative	1.598	1.445	----	0 - 6	0.794	0.060	-.1720
Career Progress	3.379	1.944	----	0 - 6	-0.251	----	.2035
Responsibility	2.129	1.880	----	0 - 6	0.630	0.198	.5497
Time Pressure	1.871	1.749	----	0 - 6	0.869	-0.204	.5067
Organisational Politics	3.261	1.876	----	0 - 6	-0.069	----	.3825
Composite Stressor#	31.970	11.243	0 - 72	0 - 61	-0.017	----	.7836
Coping							
Recreational	15.417	6.298	----	2 - 28	-0.124	----	.6918
Physical (Self-Care)	11.280	5.822	0 - 30	1 - 26	0.245	----	.6682
Social Support	24.227	5.540	----	3 - 30	-1.371	0.191	.7480
Rational/Cognitive	18.864	5.721	----	4 - 30	-0.338	----	.6753
Composite Coping#	69.083	16.492	0 - 120	20 - 100	-0.358	----	.8354
Belief							
Social Supp Demands	4.879	3.427	0 - 15	0 - 15	0.656	0.098	.5510
Expectancy							
Psychological Stress	5.985	4.361	0 - 15	0 -15	0.551	0.139	.7894
General Health	4.333	3.217	0 - 9	0 - 9	0.230	----	.8188
Composite Expectancy#	9.364	5.917	0 - 21+	0 - 24	0.164	----	.8222
Dispositional							
Neuroticism#	11.356	4.960	0 - 24	0 - 22	0.138	----	.8251
Strain							
Physical	16.348	9.308	0 - 60	0 - 43	0.552	-0.264	.8415
Psychological	8.636	7.006	0 - 30	0 - 27	0.674	0.149	.8445
Composite Strain#	21.311	12.235	0 - 75*	0 - 55	0.423	-0.059	.8639

Note: n = 132; Composite# - Scale Formed From Items used in Sub-Scales; Tran/Var Skew++ - Variable Transformed to Reduce Skewness; Scale Range+ - Variables Removed to Improve the Reliability or Face Validity of the Scale; Neuroticism# - The Alpha Coefficient is Calculated From n = 118.

Neuroticism Scale

The mean score for the Neuroticism scale (i.e., 11.356) approximates that expected for a normal distribution (i.e., scale range 0 - 24) and reflects the near normal distribution of the responses to the items in the scale (i.e., skew = 0.138). Furthermore, the SD for scale (i.e., 4.960) approximates the expected value from the range of responses to the scale (i.e., 22/4 = 5.5). In addition, when compared to the EPI standardised data for neuroticism, the mean and SD for the present sample is essentially similar to the normative data (i.e., mean 10.523 and SD 4.708) for a normal population (Eysenck & Eysenck, 1964, Table 5, p. 17).

Strain Scales

The mean scores for the Physical (i.e., 16.348), Psychological (i.e., 8.636) and Composite Strain (i.e., 21.311) scales are all substantially less than the expected theoretical mean for the range of the respective scales and a normal distribution (i.e., 30.0, 15.0 and 37.5 respectively). The mean for the physical symptoms scale is 13.65 below the expected value; that for psychological symptoms 6.36 below the expected value; and the composite scale, 16.19 below the expected value. In effect, the lower than expected values reflect the significant positive skewness of the responses to the respective scales (i.e., 0.552, 0.674 and 0.423 $\geq$ 0.422 respectively) and the resultant constrictions in the range of responses toward the less frequent pole of the response scale. It reflects the tendency for respondents to more frequently use either the "no" or "sometimes" response anchors of the respective strain scales. In other words, the participants report frequencies for symptoms of physical and psychological strain which are seemingly substantially below the expected theoretical value; moreover it implies that the participants do not in general experience high and consistent levels of stress and thus subse-

quent symptoms of strain. Indeed, on this basis, it is likely that the relationship between sources of stress and strain will be low for this sample of youthworkers and therefore unlikely to explain more than a small amount of the variance in symptoms of strain.

Scale Skewness

The responses to the stressor scales in the main tend to be skewed in the positive direction. This indicates that participants view many of the dimensions of stressors as either never present or only sometimes present in their work environment. Similarly, those for the belief, expectancy, neuroticism and strain scales tend to be skewed in the positive direction and those for the coping scales, in the negative direction. As a result, scales with skewness values ≥ 0.422 (i.e., 2 SE's for skew) were transformed to normal distributions using square root transformations of the response distributions (Tabachnick & Fidell, 1989).

Internal Consistency

Cronbach alpha coefficients for the coping, expectancy, neuroticism and strain scales indicate that the internal consistency of these scales is moderate. The alpha coefficients for these scales ranging from a low 0.6682 for the Physical Coping scale to a maximum 0.8639 for the Composite Strain scale. The alpha coefficient for the seven item Composite Expectancy scale (i.e., 0.8222), however, reflects the removal of item "When I complain a lot, my supervisor and colleagues will not listen to me" from the scale due to its reducing or negative effect on the reliability of the scale. That is, if retained in the scale, the low corrected item-total correlation for the item (i.e., $r = 0.2040$) reduces the reliability of the scale from $\alpha = 0.8222$ to $\alpha = 0.8016$.

Similarly, the alpha coefficient for the Composite Strain scale reflects the removal of five variables from the provisional scale. As a result, the reliability of the scale may in effect be reduced due to this reduction in the number of items in the scale. The item "I have a good sense of humour" from the Psychological Strain scale, was removed from the Composite Strain scale due to its negative correlation with items in the scale and the resultant reducing effect on the reliability of the scale. In addition, the following items from the Physical Strain scale: "Falling/Staying Asleep" "Irritability" "Tense/Anxious" and "Depression" were deleted from the Composite Strain scale due to their apparent redundancy or similarity with items in the Psychological Strain scale.

The alpha coefficient for the Beliefs Social Support Demands scale (i.e., $\alpha = .5512$) can be seen as marginal for acceptable reliability and may reflect the effect of significant positive skewness (i.e., 0.656) on the variability of the responses to the items in the scale. Furthermore, the alpha coefficient implies that errors in measurement (i.e., random & non-random) account for 45% of the variability in the response to the belief items used in the scale; moreover, it indicates that the maximum possible validity for the scale is a low 0.7424. For instance, each belief item concluded with the phrase . . ."is demanding" and therefore it gave participants the opportunity to agree with item. However, contrary to this notion, the scale is significantly skewed in the opposite direction, the response to the items is predominantly "No" or "Sometimes". Thus, it would appear that the responses to the items are in effect valid; participants have, it would seem, given thoughtful consideration to the items; further, it implies that they have concrete views on the nature and effects of social support.

The Cronbach alpha coefficients for the stressor scales are, however, by and large poor. They range between -0.1720 and 0.5976 and across the scales, average a rather low 0.2689. As a result, the scales were discarded from the measurement model and composite scales formed from a principal components factor analysis of the 24 stressor items and varimax rotation of the three factor solution.

D.1.1.1 Factor Work Role Stressor Scales

Table D.2 shows the variable distribution on the three independent factors, factor loadings ≥ 0.3, eigen values for the factors and the cumulative variance explained by the three factor solution.

As the table shows, cross loadings across the factors are minimal; 11 of the 24 variables loading on factor 1, seven on Factor 2 and six on Factor 3. Variable 19 "There is just enough time to do my work" with a factor loading of 0.6862 had the highest correlation with Factor 1; Variable 2 "Employees are not able to use their full skills and abilities while doing the job" with a factor loading of 0.7893, the highest correlation with Factor 2; and Variable 9 "Employees are only asked to participate in making trivial decisions" with a factor loading of 0.6682, the highest correlation with Factor 3.

Further, with the exception of Variable 17 which loads on Factors 1 (0.6330) and 3 (0.3052) and Variable 8 which loads on Factors 2 (0.4735) and 3 (0.4153), cross loadings on the factors are all less than 0.3. As a result, the factors may be seen as essentially independent in nature. From this solution, scales designed to measure role-overload, role-insufficiency and role-boundary work stressors were formed from the variables loading on the respective factors.

Table D.2
Factor Analysis - Principal Components Extraction: Common Stressor Items - Variable 1 to Variable 24

Varimax Rotation		Factor Loadings*		
Variables		Factor 1	Factor 2	Factor 3
Time to Do Work	(19)	.6862		
Too Much Work to Do	(21)	.6610		
Responsibility for Many Activities	(17)	.6330		.3052
Not Sure What Is Expected of Me	(15)	.6305		
Responsible for Providing Information	(18)	.6303		
Unreasonable Time Deadlines	(13)	.6254		
Do Work I'm Not trained to Do	(16)	.5830		
Conflicting Requests	(14)	.5807		
Work Under Conflicting Policies	(6)	.4658		
Held Accountable for Others Work	(12)	.3782		
Bend Rules to Get Job Done	(24)			
Not Able to Make Full Use of Skills	(2)		.7893	
Opinions of Employees not Considered	(4)		.6223	
Supervisors Support Subordinates	(3)		.6204	
Challenging Work	(5)		.5826	
Rewards Not Handed Out Fairly	(8)		.4735	.4153
Promotions on Performance	(1)		.4461	
Limit of My Present Skills/Abilities	(22)			
Participate in Decision Making	(9)			.6682
Supervisors Trust in Subordinates	(7)			.6362
Opportunities For Advancement	(11)			.5813
Work Quality Standards Unrealistic	(10)			.5457
Limits of My Present Skills/Abilities	(23)			.5014
Limits of my Authority	(20)		.3106	.3349
Eigen Values		4.5409	2.4748	1.7853
Cumulative Variance		18.90%	29.20%	36.70%

Note: n = 132; Item/subject ratio 1:5.5; *Factor loadings 0.3 or greater shown; KMO = 0.6852; Bartlett Test of Sphericity = 840.8206, p .0000; Reproduced Correlations Residual's - 149 (53%) > 0.05

D.1.1.2 Descriptive Statistics: Factor Work Role Stressor Scales

Table D.3 provides a descriptive summary of the six item Role-Boundary scale, seven item Role-Insufficiency scale and eleven item Role-Overload scale. The mean scores approximate those expected from the scale range and a normal distribution; and likewise, the SD's approximate those expected from the observed range of responses and relatively normal distribution.

Further, with respect to skewness, the Role-Overload scale was the only scale with significant skewness (i.e., skew = 0.590). It was subsequently transformed to approximate normality (i.e., skew = -0.050) using a square root transformation of the responses to items in the scale. Cronbach alpha coefficients range between 0.6060 for the six item Role-Boundary scale and 0.7969 for the eleven item Role-Overload scale; the higher coefficient for the Role-Overload scale reflecting the cumulative effect from the higher number of items in the scale.

Table D.3
Descriptive Statistics: Common Work Role Stressor Scales

Stressor Scale	Mean	SD	Scale Range	Observed Range	Skew	Tran/Var Skew++	Alpha
Role-Boundary (6)	8.864	4.226	0 - 18	0 - 18	-0.115	----	.6060
Role-Insufficiency (7)	9.167	4.250	0 - 21	0 - 19	0.240	----	.6260
Role-Overload (11)	13.758	7.272	0 - 33	0 - 33	0.590	-0.050	.7969
Composite Work Role#	31.970	11.243	0 - 72	0 - 61	-0.017	----	.7836

Note: n = 132; Composite Work Role Scale - Scale Formed from Role-Stressor Scales; Tran/Var Skew++ - #Variable Transformed to Reduce Skewness; ( ) Number of Items in Scale.

D.1.2 Regression Analyses

Table D.4 depicts the results from a series of "model building" backward regression models which explored the relative effect of significant work role stressor, belief and expectancy scales on dimensions of strain. Table D.5, shows the results from a further series of "model building" backward regression models which explored the relative effect of significant coping behaviours when in the presence of significant work role stressor, belief and expectancy scales on dimensions of strain. Table D.6, the results from a

series of backward regression models which sought to identify (a) the relative effect of neuroticism when included in the model; and (b) the model of best fit (i.e., most parsimonious explanation for the symptoms of strain reported by the sample) from the relative effect of the significant predictors identified in the baseline analyses.

In addition, Tables D.7 and D.8 present the results from a series of hierarchical models which sought to test and identify the theoretical importance and incremental effect of beliefs concerning social support demands on the explained variance when placed in the presence of significant neuroticism, work role stressors and coping variables.

D.1.2.1 Model Building Analyses: Role Stressor, Expectancy and Belief Scales

Tables D.4 and D.5 show the results from analyses that explored the relative effect of significant work role stressors, expectancy and belief scales identified in the baseline analyses on physical and psychological measures of strain. Those shown in Table D.4 reflect the effect of the Expectancy Psychological Stress scale in the respective models; and those presented in Table D.5, the effect of the Composite Expectancy scale in the respective models.

From the result for the physical strain model (see Table D.4), the effect of personal beliefs associated with social support demands is the only scale which contributes useful information to the explained variance; it explains a moderate 21.97% (21.37% adj) of the variance in symptoms of physical strain. In comparison, the psychological strain model explains an increased 26.39% (24.66% adj) of the variance in symptoms of psychological strain from the relative effect of Belief Social Support, Role-Boundary and Role-Overload scales.

Moreover, as shown in the solution for each model, the relative effect of beliefs associated with social support demands is both the dominant predictor in the models and the only common predictor of strain across the regression models. This result further highlights (a) the relative importance and (b) the significant involvement of appraisal processes in the stress process and the translation to symptoms of strain

Table D.4
Backward Regression: Physical and Psychological Strain Scales on Significant Work Role Stressor, Expectancy Psychological Stress and Belief Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Physical Strain#	Belief Social Support#	21.97%	21.37%	0.4688	6.050	.0000
Mult R=.4688; SE 1.0163; F(1,130) 36.6077, p. 0000						
	Belief Social Support#			0.3439	4.470	.0000
Psych Strain#	Role-Boundary	26.39%	24.66%	0.2103	2.571	.0113
	Role-Overload#			0.2027	2.446	.0158
Mult R=.5137; SE 0.9500; F(3,128) 15.2943, p. 0000						

Note: pout, ≥ .051; #Transformed Variable; Physical and Psychological Strain Scales - Transformed Scales

The results in Table D.5 further illustrate the relative significance and involvement of belief and expectancy appraisal processes in the transactional process of stress. In addition, they show the benefit of using a more general measure of appraisal (i.e., Composite Expectancy scale) to explain the relationship between personal demands and symptoms of strain. As the table shows, the Composite Expectancy scale contributes useful information to the explained variance when in the presence of belief and common work role demands in the physical strain model.

Table D.5
Backward Regression: Physical and Psychological Strain on Significant Work Role Stressor, Composite Expectancy and Belief Social Support Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Physical Strain	Belief Social Support#	25.87%	24.72%	0.4149	5.281	.0000
	Composite Expectancy			0.2046	2.604	.0103
Mult R=.5086; SE 0.9944; F(2,129) 22.5098, p. 0000						
	Belief Social Support#			0.3439	4.470	.0000
Psych Strain	Role-Boundary	26.39%	24.66%	0.2103	2.571	.0113
	Role-Overload#			0.2027	2.446	.0158
Mult R=.5137; SE 0.9500; F(3,128) 15.2943, p. 0000						

Note: pout, ≥ .051; #Transformed Variable; Physical and Psychological Strain Scales - Transformed Scales

As shown in the table, the physical strain model explains a moderate 25.87% (24.72% adj) of the variance in strain from the relative effect of the Belief Social Support and Composite Expectancy scales; and the psychological strain model, a slightly higher 26.39% (24.66% adj) of the explained variance from the relative effect of personal belief, role-boundary and role-overload demands. Further, when the results are compared to those in Table D.4, the effect of the Expectancy Composite scale adds 3.9% (3.35% adj) to the 21.97% (21.37% adj) of the variance in physical strain explained by the belief scale. Thus, due to this result and similarly that for the composite strain model (see Table 3.2.4.7), the Expectancy Psychological Stress scale was eliminated from subsequent model building analyses.

D.1.2.2 Model Building Analyses: The Relative Effect of Coping Behaviours and Relative Utility of Strain Scales

Table D.6 shows that the inclusion of significant coping behaviours in the physical and psychological strain models effects a substantial increase in the explained variance. The physical strain model explains an increased 40.31% (38.91% adj) of the variance in physical strain from the additional effect of recreational and rational/cognitive coping

behaviours; and the psychological strain model, a much higher 51.82% (50.30% adj) of the variance in psychological strain from the additional effect of rational/cognitive and physical coping behaviours.

Furthermore, for each solution, the negative Beta coefficients indicate the moderating effect of coping behaviours on symptoms of strain. In addition, for each model, the relative effect of (a) rational/cognitive coping and (b) beliefs associated with social support demands, contribute useful information to the explained variance in strain. That is, for each model, the solution further illustrates the prominent role of appraisal processes in the stress process.

Table D.6
Backward Regression: Physical and Psychological Strain Scales on Work Role Stressor, Composite Expectancy, Belief and Coping Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Physical Strain#	Social Support Demands#	40.31%	38.91%	.3226	4.467	.0000
	Recreational Coping			-.3156	-4.150	.0001
	Rational Cognit Coping			-.2205	-2.900	.0044
Mult R=.6349; SE 0.8958; F(3,128) 28.8075, p. 0000						
Psycholog Strain#	Rational Cognit Coping	51.82%	50.30%	-.4536	-6.601	.0000
	Physical Coping			-.2186	-3.251	.0015
	Role-Boundary			.1981	3.166	.0019
	Social Support Demands#			.2015	3.108	.0023
Mult R=.7198; SE 0.7717; F(4,127) 34.1429, p. 0000						

Note: pout, ≥ .051; #Transformed Variable; Physical and Psychological Strain Scales - Transformed Scales

Further, when compared to the cumulative effect of the work role, expectancy and personal belief sources of stress on symptoms of strain (see Table D.5), the relative effect of coping behaviours adds 14.44% (14.19% adj) to the variance explained by the

Physical Strain model; an increased 25.43% (25.64% adj) to the variance explained by the Psychological Strain model; and a similar 25.30% (25.52% adj) to the variance explained by the Composite Strain model (i.e., see Tables 3.2.4.7 & 3.2.4.8).

Relative Utility of Strain Scales

Equally important, the results for the relative effect of coping behaviours on physical, psychological and composite symptoms of strain (see Tables 3.2.4.8 & D.6) reveal the benefits of adopting a composite or less specific approach to the measurement of strain. As the results show, when compared to the variance in strain explained by the Physical Strain scale (i.e., 40.31%, 38.91% adj) the Psychological Strain scale accounts for an additional 11.51% (11.39% adj) of the variance in strain; and the Composite Scale scale, an additional 13.29% (13.23% adj) of the explained variance.

Further, when the relative utility of strain scales is compared to the variance explained by the models of best fit (see Table 3.2.4.9) the 25 item Composite Strain scale is clearly the more useful but not the most parsimonious measure of strain. It captures an additional 9.37% (9.33% adj) of the explained variance beyond the 48.87% (47.26% adj) explained by the Physical Strain scale; and 6.42% (6.29% adj) beyond the 51.82% (50.30% adj) explained by the Psychological Strain scale. However, when seen in terms of parsimony, the ten item Psychological Strain scale, although restricted to the measurement of mood and adjustment symptoms of strain, is clearly the more efficient measure of strain. Each item in the scale accounts for 5.182% (5.03% adj) of the variance explained by the model; those in the Composite Strain scale, a much lower 2.34% (2.26% adj) of the variance explained by the model.

D.1.2.3 Hypothesis Testing

Hierarchical modelling was used to (a) confirm the theoretical importance of personal beliefs in the Physical and Psychological strain models; and (b) test the hypothesis (H2) that the incremental effect of personal beliefs associated with the provision of social support would add significant information to the cumulative variance explained by the model when placed in the presence of work role stressor, expectancy, coping and neuroticism predictors of strain. As the summary results for the Physical Strain (Table D.7) and Psychological Strain (Table D.8) models show, the incremental effect of personal beliefs associated with the provision of social support adds useful information to the explained variance in symptoms of strain.

Table D.7
Hierarchical Regression: Physical Strain on Neuroticism, Coping, and Belief Social Support Scales

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
	Step 1								
Disposition	Neuroticism	35.61%	35.11%	35.61%	.0000	.5967	0.112 - 0.180	-8.479	.0000
Mult R=.5967; SE 0.9232; F(1,130) 71.8905, p. 0000									
	Step 2								
Coping	Recreational	45.95%	44.68%	10.34%	.0000	-.2305	-0.070 - -0.014	-2.953	.0037
	Physical					-.1737	-0.063 - -0.005	-2.320	.0219
Mult R=.6779; SE 0.8524; F(3,128) 36.2720, p. 0000									
	Step 3								
Belief	Soc S Demands#	48.87%	47.26%	2.92%	.0080	.1954	0.090 - 0.590	2.695	.0080
Mult R=.6991; SE 0.8323; F(4,127) 30.3509, p. 0000									

Note: Pout, ≥ .05; #Transformed Variable; Physical Strain Scale - Transformed Scale.

As the results for the Physical Strain model indicate, when placed in the presence of significant neuroticism and coping variables, the incremental effect of personal beliefs on the cumulative variance explained by the model is weak. It adds a rather low 2.92% (2.58% adj) to the cumulative variance explained by the cumulative effect of dispositions for neuroticism and coping behaviours (i.e., 45.95% or 44.68% adj). Further, having *partialled out* or partioned the variance common to neuroticism in the model, the incremental effect of physical and recreational coping add a somewhat lower than expected 10.34% (9.57% adj) to the explained variance. That is, this result would seem to indicate that in addition to these coping behaviours, other methods of coping are used by individual's to adapt to the positive relationship between neuroticism and symptoms of physical strain.

Table D.8
Hierarchical Regression: Psychological Strain on Work Role Stressor, Coping, and Belief Social Support Scales

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
	Step 1								
Work Role Stressor	Role-Boundary	8.91%	8.21%	8.91%	.0005	.2985	0.034 - 0.120	3.567	.0005
Mult R=.2985; SE 1.0486; F(1,130) 12.7203, p. 0005									
	Step 2								
Coping	Rational/Cognitive	48.15%	46.94%	39.24%	.0000	-.4964	-0.073 - -0.022	-7.136	.0000
	Physical					-.2518	-0.121 - -0.069	-3.672	.0004
Mult R=.6939; SE 0.7973; F(3,128) 39.6245, p. 0000									
	Step 3								
Belief	Soc S Demand#	51.82%	50.30%	3.66%	.0023	.2015	0. 122 - 0.548	3.108	.0023
Mult R=.7198; SE 0.7717; F(4,127) 34.1429, p. 0000									

Note: Pout, ≥ .05; #Transformed Variable; Psychological Strain Scale - Transformed Scale.

Similarly, as evident from the results for the psychological strain model, the unique effect of personal beliefs in the model adds a rather low 3.66% (3.36% adj) to the cumulative variance explained by common work stressor and coping predictors of strain. However, in contrast to the effect of coping in the physical strain model, the incremental effect of rational/cognitive and physical coping strategies adds a substantially higher 39.24% (38.73% adj) to the variance explained by common role-boundary stressors. In other words, the data from both models would seem to suggest that dispositions for neuroticism underlie or influence the effectiveness of coping strategies in strain related outcomes.

Therefore, given these results, the findings illustrate that the personal meaning (i.e., personal beliefs) assigned to the provision of social support contributes both unique and significant information to the explained variance in symptoms of physical and psychological strain when placed in the presence of significant predictors of strain. Furthermore, they illustrate the theoretical importance and functional involvement of personal beliefs (i.e., appraisal) in the prediction of physical and psychological strain related outcomes. As a result, there is support for the hypothesis (F2) that the incremental effect of personal beliefs associated with the provision of social support would contribute significant information to the explained variance in strain when placed in the presence of work role stressors, expectancies, coping behaviours and neuroticism.

D.2 Strain Scale Evaluations

Table D.9 compares the ability of original and transformed Physical, Psychological and Composite Strain scales to capture or account for the translative effects (i.e., translation of stress to strain) of common work stressors and expectancy work stressors. As the data indicates, in terms of relative efficiency, the Composite Strain (transformed) scale provides the more effective method by which to measure symptoms of strain. For

instance, when used with the work role stressor scales it explains 25.16% (adj) of the variance in strain; with the stressor and coping scales a substantially higher 52.73% (adj) of the variance; and with the model of best fit, an increased 56.59% (adj) of the variance in strain.

However, as further evident from the table, significant skewness in the original strain scales acts to reduce the variance explained by each of the models. For instance, the model of best fit using the transformed Physical Strain scale explains 47.26% (adj) of the variance in physical strain; whereas the model of best fit using the original Physical Strain scale, explains a lower 44.03% (adj) of the variance.

Further, the effect of skewness tends to destabilise the consistency of regression solutions. For instance, when the original Composite Strain scale is used with the stressor scales model, the solution identifies role-overload as a predictor of strain; however, when the transformed scale is used with the model, the solution identifies role-boundary as a predictor of strain. Therefore, the results from models using strain scales with significant skewness may in effect be somewhat misleading if not invalid.

When seen in proportional terms, however, the transformed Psychological Strain scale provides the more efficient approach to the measurement of symptoms of strain. For instance, when related to the models of best fit, each item in the ten item Psychological Strain scale accounts for 5.03% (adj) of the explained variance; whereas for the 20 item Physical Strain scale, each item accounts for a reduced 2.36% (adj) of the explained variance; and those in the 25 item Composite Strain scale, a slightly lower 2.28% (adj) of the explained variance. Therefore, in terms of efficiency, the Psychological Strain scale provides the more specific and parsimonious approach to the measurement of symptoms in strain. In terms of relational effectiveness, however, the Composite Strain scale consistently accounts for the highest amount of the explained vari-

ance across the regression models. For instance, from the results for the stressor/coping scales models, in comparison to the Physical Strain scale, it accounts for an additional 13.23% (adj) of the explained variance. Similarly, for the models of best fit, when compared to the Physical Strain scale it accounts for an additional 9.69% (adj) of the explained variance; and compared to the Psychological Strain scale, an additional 6.29% (adj) of the explained variance.

Therefore, when seen in terms of conceptual understanding, the Composite Strain scale provides (a) the more valid, specific and versatile approach to the measurement of symptoms of strain and (b) the more instructive insight to the negative effects or relationship of predictor variables with symptoms of strain. As indicted by the data, the inclusion of the physical strain items from the Physical Strain scale with the items in the Psychological Strain scale enables the Composite Strain scale to account for substantially more of the variance in symptoms of strain.[D1] Furthermore, if there is a need to explore the linkage between stressors and facets of strain, it is possible to extract discrete measures of psychological and physical strain from the Composite Strain scale.

[D1] Note: When combined with the Psychological Strain scale, the deletion of four items from the Physical Strain scale (see 3.2.4.4.2) changes the face validity of the scale to a measure of Physical Strain.

Table D.9
Strain Scale Evaluations: Original and Transformed Physical, Psychological and Composite Strain Scales.

Strain Scales	Regression Models (Backward Analyses)					
	Stressor Models		Stressor/Coping Models		Model of Best Fit	
	Final Model+	Rsqr (Adj)	Final Model+	Rsqr (Adj)	Final Model+	Rsqr (Adj)
Physical (20 Items)	Soc Supp Demands#	18.21%	Rat Cognit Coping Soc Supp Demands# Physical Coping Recreational Coping	36.68%	Neuroticism Recreational Coping Soc Supp Demands# Physical Coping	44.03%
Physical (Transformed)	Soc Supp Demands#	21.37%	Soc Supp Demands# Recreational Coping Rat Cognit Coping	38.91%	Neuroticism Recreational Coping Soc Supp Demands# Physical Coping	47.26%
Psychological (10 Items)	Role-Overload Soc Supp Demands Role-Boundary	23.88%	Rat Cognit Coping Role-Boundary Soc Supp Demands# Physical Coping	49.78%	Neuroticism Role-Boundary Rat Cognit Coping Physical Coping	49.59%
Psychological (Transformed)	Soc Supp Demands# Role-Boundary Role -Overload#	24.66%	Rat Cognit Coping Physical Coping Role-Boundary Soc Supp Demands#	50.30%	Rat Cognit Coping Physical Coping Role-Boundary Soc Supp Demands#	50.30%
Composite Strain (25 Items)	Role-Overload Soc Supp demands#	22.72%	Rat Cognit Coping Soc Supp Demands# Physical Coping Recreational Coping	51.21%	Neuroticism Recreational Coping Soc Supp Demands# Rat Cognit Coping Physical Coping	54.80%
Composite Strain (Transformed)	Soc Supp Demands# Role-Boundary	25.16%	Rat Cognit Coping Soc Supp Demands# Recreational Coping Physical Coping	52.14%	Neuroticism Rat Cognit Coping Physical Coping Soc Supp Demands# Recreational Coping	56.59%

Note: 1) Final Model+: (a) Prob of t Value ≤.051; (b) Shown in Order of Significance; (c) Transformed Scale; 2) Variables in Model: (a) Stressor Model - See Table 3.2.4.8; (b) Stressor/Coping Model - See Table 3.2.4.9; (c) Model of Best Fit - See Table 3.2.4.10

Appendix D.3

Stress in Youthwork Survey

Juvenile Justice

KEELONG JUVENILE JUSTICE CENTRE.
STAFF ROAD,
UNANDERRA, N.S.W 2526

TEL.: (042) 71 5044
FAX: (042) 71 5697

UNIVERSITY OF WOLLONGONG/OFFICE OF JUVENILE JUSTICE

Stress in Youthwork Survey

Welcome to the stress at work survey. The aim of this addition to your paperwork load is to evaluate stress in Juvenile Justice Centres. The results, which will not identify individuals, will go to you - in terms of a short report - and to Head Office.

The survey is being conducted by Geoff Troth (Psychologist - Keelong Juvenile Justice Centre) and Tom Abson (Postgraduate, Department of Psychology, University of Wollongong).

We cannot promise that the results will revolutionise your work conditions. However, we do hope that they will contribute towards positive change.

To have maximum impact we need a total picture of stress. Please, therefore, fill in the questionnaires (which are shorter than they look - the personality questionnaire on the end is optional) and return them to Geoff or your Unit Psychologist.

If you have any further questions please ask Geoff (TEL: (042) 715044) or your Unit psychologist.

Thanks for your help.

Geoff Troth - Office of Juvenile Justice

Tom Abson - University of Wollongong

Dealing with stress:
Useful contact services
- Industrial Program Service
- Lifeline
- Unit Psychologist

Appendix D.3.1

Stress Diagnostic Survey

Stress Diagnostic Survey

This stress survey is designed to provide information about stress at work. It is a standardised survey and therefore allows your results to be compared with those from other groups. There are no right or wrong answers to the survey. The best answer to each item is the one that most nearly describes the way you see strain or emotional upsets at work. For each question indicate

Y for **YES ALWAYS** if you see your job this way.

N for **NO NEVER** if you never see your job this way.

S for **SOMETIMES** if you sometimes see your job this way.

		Y/N/S
Q1	Promotions are not based on performance.	_____
Q2	Employees are not able to use their full skills and and abilities while doing the job.	_____
Q3	Supervisors do not go to bat for their subordinates with their superiors.	_____
Q4	Opinions of employees about the job are not listened to by management.	_____
Q5	Job assignments are not challenging.	_____
Q6	Sometimes I have to work under policies or guidelines which conflict with each other.	_____

		Y/N/S
Q7	Supervisors show a lack of trust in their subordinates	_____
Q8	The rewards for working here are not handed out fairly.	_____
Q9	Employees are only asked to participate in making trivial decisions.	_____
Q10	The work quality standards here are unrealistic.	_____
Q11	There are insufficient opportunities for advancement in this organisation.	_____
Q12	I am held too accountable for the work of my co-workers.	_____
Q13	The time deadlines for completing work assignments are too unreasonable.	_____
Q14	I seem to receive conflicting requests from different people (eg. co-workers, bosses).	_____
Q15	I am not sure of exactly what is expected of me.	_____
Q16	I do things on the job that I have not been trained to do.	_____
Q17	I am responsible for too many different activities.	_____
Q18	I am too responsible for providing needed information to others.	_____
Q19	There is just not enough time to do my work.	_____
Q20	I am not certain of how much authority I have.	_____
Q21	I have too much work to do to be able to complete it all in a timely fashion.	_____
Q22	I can't do a good job with my present skills and abilities.	_____
Q23	I am not learning new skills in my job.	_____
Q24	I sometimes have to bend a rule or policy to get the job done.	_____

Appendix D.3.2

Psychological Strain Scale

Psychological Strain Scale

This next piece asks some questions about your feelings and mood at the present time - i.e., Over the past week or so. Again the answers are yes, always (y); no, never (n); and sometimes (s).

Once again, there are no right or wrong answers and your first answer is the one we want

---

		Y/N/S
Q1	Lately, I am easily irritated.	_____
Q2	Lately, I have been depressed.	_____
Q3	Lately, I have been feeling anxious.	_____
Q4	I have been happy lately.	_____
Q5	So many thoughts run through my head at night that I have trouble falling asleep.	_____
Q6	Lately, I respond badly in situations that normally wouldn't bother me.	_____
Q7	I find myself complaining about little things.	_____
Q8	Lately, I have been worrying.	_____
Q9	I have a good sense of humour.	_____
Q10	Things are going about as they should.	_____

Appendix D.3.3

Expectancy Psychological Stress Scale

Expectancy Psychological Stress Scale

Now this bit asks something different. We want to know how you believe stress effects you - rather than does this thing or that thing stress you. This time for each question indicate:

Y for yes **VERY LIKELY** that this will influence my work relationships and/or job performance.

N for no **VERY UNLIKELY** that this will influence my work relationships and/or job performance.

S for **SOMETIMES LIKELY** will influence my work relationships and/or job performance.

		Y/N/S
1.	When I feel irritable my patience with colleagues and residents will become shorter.	_____
2.	When I feel depressed, my work performance will deteriorate.	_____
3.	When I have trouble falling or staying asleep, my work and relations with others at work will suffer the next day.	_____
4.	When I complain a lot, my supervisor and colleagues will not listen to me.	_____
5.	When I am worried, I will not be able to concentrate on my work properly.	_____

Appendix D.3.4

Personal Resources and Demands Questionnaire

Personal Resources and Demands Questionnaire

In this next bit, we need to gather some information about how you behave. Again there are no right or wrong answers. Answer **yes** if the statement always describes your behaviour; **no** if the statement really does not describe your behaviour; **sometimes** if you sometimes behave this way. Please don't think too long about each question, your first answer is the one we want.

		Y/N/S
1.	When I need a vacation I take one.	_____
2.	I am able to do what I want to in my free time.	_____
3.	On weekends I spend time doing the things I enjoy	_____
4.	Lately, my main recreational activity is watching television.	_____
5.	A lot of my free time is spent attending performances (e.g. sporting events, theatre, movies, concerts, etc).	_____
6.	I spend a lot of my free time in participating activities (e.g. sports, music, painting, woodworking, sewing, etc).	_____
7.	I spend a lot of my time in community activities (e.g. scouts, religious, school, local government etc).	_____
8.	I find engaging in recreational activities relaxing.	_____
9.	I spend enough time in recreational activities to satisfy my needs.	_____
10.	I spend a lot of my free time on hobbies (e.g. collections of various kinds etc).	_____
11.	I am careful about my diet (e.g. eating regularly, moderately, and with good nutrition in mind).	_____

Personal Resources and Demands Questionnaire Continued . . .

		Y/N/S
12.	I get regular physical checkups.	_____
13.	I avoid excessive use of alcohol.	_____
14.	I exercise regularly (at least 20 minutes most days).	_____
15.	I practice "relaxation" techniques.	_____
16.	I get the sleep I need.	_____
17.	I avoid eating the things I know are unhealthy (e.g. coffee, tea, cigarettes etc).	_____
18.	Being available to the one person or special group of people to whom I feel really close is demanding.	_____
19.	I engage in meditation.	_____
20.	I practice deep breathing exercises a few minutes several times a day.	_____
21.	I set aside time to do the things I really enjoy.	_____
22.	There is at least one person important to me who values me.	_____
23.	I have help with the tasks around the house.	_____
24.	Helping with tasks around the house is demanding.	_____
25.	I have help with the important things that have to be done.	_____
26.	There is at least one sympathetic person with whom I can discuss my concerns.	_____
27.	There is at least one sympathetic person with whom I can discuss my work problems.	_____
28.	I feel I have at least one good friend I can count on.	_____
29.	I feel loved.	_____
30.	There is a person with whom I feel really close.	_____
31.	I have a circle of friends who value me.	_____

Personal Resources and Demands Questionnaire Continued . . .

		Y/N/S
32.	I gain personal benefit from participation in formal social groups (e.g. religious, political, professional organisations, etc).	_____
33.	Being available to people at work to discuss their work related problems is demanding.	_____
34.	I am able to put my job out of my mind when I go home.	_____
35.	I feel that there are other jobs I could do beside my current one.	_____
36.	Being a member of a circle of friends is demanding.	_____
37.	I periodically re-examine or reorganise my work style and schedule.	_____
38.	I can establish priorities for the use of my time.	_____
39.	Once they are set, I am able to stick to my priorities.	_____
40.	I have techniques to help avoid being distracted.	_____
41.	I can identify important elements of problems I encounter.	_____
42.	Letting others know that I love and care for them is demanding.	_____
43.	When faced with a problem I use a systematic approach.	_____
44.	When faced with the need to make a decision I try to think through the consequences of choices I might make.	_____
45.	I try to keep aware of important ways I behave and things I do.	_____

Appendix D.3.5

Biographical Data

Biographical Data

You will be surprised to know that like all good questionnaires, this one needs you to tell us not who you are but in questionnaire terms, what you are. Please be patient with this boring bit and fill it in as accurately as possible.

Please answer by circling the appropriate items, or write in the area provided.

Sex: Male ____ Female ____

Age: Under 21/ 21-36/ 37-55/ Over 55

Marital Status: Married/ Single/ Divorced/ Defacto/ Widowed

No of Children: _____

Position: _____

Years in Position: _____

Work Centre:

- Keelong ☐
- Reeby ☐
- Yambi ☐
- Minda ☐
- Cobham ☐

Academic Level Reached:

- No Formal Qualifications ☐
- School Certificate or Equivalent ☐
- Higher School Certificate or Equivalent ☐
- Degree Level or Equivalent ☐
- Higher Degree Level ☐

Appendix D.3.6

Personal Health Scale

Personal Health Scale

(After Osipow, S. H., & Spokane, A. R., 1983; Smith, P., & Bennett, S., 1983)

We also need to know about your general health. Listed below are a number of common health problems. We need to know how frequently you suffer from them. For each problem indicate:

Y for **YES OFTEN** if you frequently suffer from these problems.

N for **NO NEVER** if you never suffer this problem.

S for **SOMETIMES** if you sometimes suffer this problem.

Q1 Stomach upsets _____

Q2 Unplanned weightgain _____

Q3 Eyestrain _____

Q4 Coughing _____

Q5 Erratic eating _____

Q6 Tiredness _____

Q7 Eat Wrong Foods _____

Q8 Uninterested _____

Q9 Falling/staying asleep _____

Q10 Irritability _____

Q11 Colds _____

Q12 Excess Drinking _____

Q13 Tense/anxious _____

Q14 Aches/Pains _____

Q15 Appetite (Hungry) _____

Q16 Indigestion _____

Q17 Depression _____

Q18 Flu _____

Q19 Loss of Appetite _____

Q20 Lethargic (Drowsy) _____

Appendix D.3.7

Expectancy General Health Scale

Expectancy General Health Scale

Here, **we want** to know about **YOUR HEALTH BELIEFS.** There are only three questions, but they are important. Please answer:

Y for yes I believe it is **VERY LIKELY** that this will influence my work relationships and job performance.

N for no I believe it is **VERY UNLIKELY** that this will influence my work relationships and job performance.

S for I believe it is **SOMETIMES LIKELY** that this will influence my work relationships and job performance.

Q1. A general feeling of being "off colour" - i.e., tiredness, irritability, depression, poor sleeping and anxiety etc, will affect my job performance and relationships at work. _____

Q2. Common infections such as colds, coughing colds and flu etc, will cause my performance at work to suffer. _____

Q3. Unexplained aches and pains - i.e., rheumatism, arthritis, pins and needles etc. will cause my performance at work to suffer. _____

Finally, as you know Geoff is the Psychologist at Keelong and Tom works in the Psychology Department at the University of Wollongong. The questions up to now were chosen because of their importance for studying the stress of your job. Now, the university has a favour to ask of you. Please complete the attached standardised personality questionnaire. The data will be used along with data from this stress research to explore questions about whether or not personality difference is related to stress.

Thanks for your help, Geoff and Tom.

Appendix D.3.8

Personality Questionnaire (EPI)

Personality Questionnaire

Instructions:
Here are some questions regarding the way you behave, feel and act. After each question is a space for answering "YES" or "NO"

Try to decide whether "YES" or "NO" represents your usual way of acting or feeling. Then put a cross in the box under the column headed "YES" or "NO". Work quickly, and don't spend too much time over any question; we want your first reaction, not a long-drawn out thought process. The whole questionnaire shouldn't take more than a few minutes. Be sure not to omit any questions.

Now turn the page over and go ahead. Work quickly, and remember to answer every question. There are no right or wrong answers and this isn't a test of intelligence or ability, but simply a measure of the way you behave.

		YES	NO
1.	Do you like plenty of excitement and bustle around you?	☐	☐
2.	Have you often got a restless feeling that you want something but do not know what?	☐	☐
3.	Do you nearly always have a "ready answer" when people talk to you?	☐	☐
4.	Do you sometimes feel happy, sometimes sad, without any real reason?	☐	☐
5.	Do you usually stay in the background at parties and "get togethers" ?	☐	☐
6.	As a child did you always do as you were told immediately and without grumbling?	☐	☐
7.	Do you sometimes sulk?	☐	☐
8.	When you are drawn into a quarrel, do you prefer to "have it out" to being silent, hoping things will blow over?	☐	☐
9.	Are you moody?	☐	☐
10.	Do you like mixing with people?	☐	☐
11.	Have you often lost sleep over your worries?	☐	☐
12.	Do you sometimes get cross?	☐	☐
13.	Would you call yourself happy-go-lucky?	☐	☐
14.	Do you often make up your mind too late?	☐	☐
15.	Do you like working alone?	☐	☐
16.	Have you often felt listless and tired for no good reasons?	☐	☐
17.	Are you rather lively?	☐	☐
18.	Do you sometimes laugh at a dirty joke?	☐	☐
19.	Do you often feel “fed up”?	☐	☐
20.	Do you feel uncomfortable in anything but everyday clothes?	☐	☐

		YES	NO
21.	Does your mind often wander when you are trying to attend closely to something?	☐	☐
22.	Can you put your thoughts into words quickly?	☐	☐
23.	Are you often "lost in thought"?	☐	☐
24.	Are you completely free from prejudices of any kind?	☐	☐
25.	Do you like practical jokes?	☐	☐
26.	Do you often think of your past?	☐	☐
27.	Do you very much like good food?	☐	☐
28.	When you get annoyed, do you need someone friendly to talk to about it?	☐	☐
29.	Do you mind selling things or asking people for money for some good cause?	☐	☐
30.	Do you sometimes boast a little?	☐	☐
31.	Are you touchy about some things?	☐	☐
32.	Would you rather be at home on your own than go to a boring party?	☐	☐
33.	Do you sometimes get so restless that you cannot sit long in a chair?	☐	☐
34.	Do you like planning things carefully, well ahead of time?	☐	☐
35.	Do you have dizzy turns?	☐	☐
36.	Do you always answer a personal letter as soon as you can after you have read it?	☐	☐
37.	Can you usually do things better by figuring them out alone than by talking to others about it?	☐	☐
38.	Do you ever get short of breath without having done heavy work?	☐	☐
39.	Are you an easy-going person, not generally bothered about having everything "just-so"?	☐	☐
40.	Do you suffer from "nerves"?	☐	☐

		YES	NO
41.	Would you rather plan things than do things?	☐	☐
42.	Do you sometimes put off until tomorrow what you ought to do today?	☐	☐
43.	Do you get nervous in places like lifts, trains, or tunnels?	☐	☐
44.	When you make new friends, is it usually YOU who makes the first move, or does the inviting?	☐	☐
45.	Do you get very bad headaches?	☐	☐
46.	Do you generally feel that things will sort themselves out and come right in the end somehow?	☐	☐
47.	Do you find it hard to fall asleep at bedtimes?	☐	☐
48.	Have you sometimes told lies in your life?	☐	☐
49.	Do you sometimes say the first thing that comes into your head?	☐	☐
50.	Do you worry too long after an embarrassing experience?	☐	☐
51.	Do you usually keep "yourself to yourself" except for a few close friends?	☐	☐
52.	Do you often get into a jam because you do things without thinking?	☐	☐
53.	Do you like cracking jokes and telling funny stories to your friends?	☐	☐
54.	Would you rather win than lose a game?	☐	☐
55.	Do you often feel self-conscious when you are with superiors?	☐	☐
56.	When the odds are against you, do you still usually think it worth taking a chance?	☐	☐
57.	Do you often get "butterflies in your tummy" before an important occasion?	☐	☐

PLEASE CHECK TO SEE THAT YOU HAVE ANSWERED ALL THE QUESTIONS.

Appendix E

Study 5

Study 5

The Personal Desirability of Common Work Stressors and their Relationship With Symptoms of Strain

The material presented in Study 5 is a secondary data analysis of a study conducted in conjunction with "Honours" student Dan Kearns and supervised by Assoc. Prof. Peter Smith from the Faculty of Commerce and Administration, Griffith University, Queensland. The research was conducted by Dan Kearns in partial fulfilment of the empirical requirements for the Bachelor of Commerce Degree with Honours offered by the School of Organisational Behaviour and Human Resource Management at Griffith University. The secondary analysis of the data is both conceptually and empirically independent from that presented by Dan Kearns in his "Honours" empirical thesis.

E.1 Abstract

This study explored the relative effect of the personal desirability (i.e., the appraised imbalance between actual and ideal sources of stress) assigned to common work stressors on symptoms of strain. The results from 135 technical college library employees show that the personal desirability assigned to common work role stressors (i.e., the appraised imbalance with the stressor) explains a moderate percentage of the variance in symptoms of strain. The personal desirability assigned to role-ambiguity and role-boundary stressors explained a moderate 17.20% (15.90% adj) of the variance in psychological symptoms of strain; and the personal desirability of role-boundary and role-ambiguity stressors, an increased 22.20% (21.00% adj) of the variance in a single item measure of personal stress. By contrast, the relative effect of measures of desirability derived from a factor analysis of the desirability scales were less powerful predictors of psychological strain and personal stress. The effect of a composite boundary/insufficiency scale predicted a substantially lower 12.10% (11.40% adj) of the variance in psychological strain; and the effect of composite ambiguity/overload and boundary/insufficiency scales, an increased 21.20% (20.00% adj) of the variance in personal stress.

In addition, the results illustrate the multifunctional utility of tripolar evaluative response scales. As the results show, it is possible to extract measures of personal desirability and personal satisfaction from the responses to the evaluative scale. That is, they illustrate that measures of personal desirability in terms of personal overload (i.e., "like less"), underload (i.e., "like more") and satisfaction (i.e., "about right") with the nature of common work role stressors each predict a significant percentage of the variance in strain. Specifically, when stressors are appraised in terms of "Like More", the personal desirability for role-ambiguity and role-insufficiency stressors explained a moderate 14.80% (13.50% adj) of the variance in psychological strain and 18.70% (17.40% adj) of the variance in personal stress. Further, when appraised in terms of "Like Less", the personal desirability of role-boundary and role-responsibility work stressors explained 14.00% (12.70% adj) of the variability in psychological strain; and the desirability of role-boundary and role-overload stressors, 17.00% (15.70% adj) of the variance in personal stress. By contrast, when the stressors are appraised in terms of "About Right For Me", the relative effect of role-ambiguity and role-boundary stressors explains a moderate 16.60% (15.30% adj) of the variance in psychological strain; and the effect of role-boundary and role-ambiguity stressors, an increased 20.80% (19.60% adj) of the variability in self-evaluations of personal stress.

Furthermore, the results show that the nature and magnitude of the desirability imbalance assigned to work stressors corresponds to the magnitude of strain related outcomes. Specifically, increases in the magnitude of imbalance scores (i.e., "Like More" and "Like Less") was found to correspond to an increase in symptoms of strain; con-versely, increases in the magnitude of balance scores (i.e., "About Right"), were found to

correspond to a decrease in symptoms of strain. Correlated T Tests using a mean substitution procedure for missing values and correction for familywise error rates confirmed that the strain mean scores corresponding to measures of imbalance and balance as significantly different.

In addition, the data shows that a single item measure of personal stress provides a more effective means to tap the translation of stress to symptoms of strain. However, as discussed, other than parsimonious value, it provides little insight to the nature of transactional relationships underlying strain related outcomes. Directions for future research are discussed.

E.2 Introduction

The results from studies one, two and three have shown that the expectancies assigned to common work stressors (i.e., beliefs concerning the probable effect of common work stressors) contribute useful information to the explained variance in symptoms of strain. However, when compared to the effect of common work stressors on strain related outcomes, the variance explained by expectancies is consistently rather small across the studies. Therefore, given these results, they suggest that the measurement and use of expectancies to tap the mental summation of the imbalance between actual (i.e., recognition of stressors) and ideal (i.e., personal meaning assigned to stressors) have limited value as predictors of strain. However, as previously discussed, it may be the case that a more holistic approach to the measurement of the personal meaning assigned to common work stressors enables is a more effective means by which to explain the nature of the transactional process underlying stress and symptoms of strain. This study, therefore, has sought to explore the measurement of common work stressors in terms of their personal desirability and their relationship with dimensions of strain.

In addition, research has shown that the structural characteristics of work systems (i.e., properties embedded in a specific job or assigned to a work group) are related to the individuals perceived "quality of working life" and outcomes such as job satisfaction, mental health and counterproductive behaviours (Murphy & Smith, 1995; Melin et al., 1999; Payne et al., 1988, p. 149). In particular, the degree of autonomy (i.e., degree of decision power) afforded to an individual in their domain of work (Gulowsen, 1972; Hackman & Oldham, 1975; Jimmieson & Terry, 1993; Karasek, 1979; Karasek et al., 1998) is often found to influence work performance (i.e., motivation), job satisfaction and strain related outcomes (Bosma, Stansfeld, & Marmot, 1998; Kelloway & Barling, 1991, Melin et al., 1999). For example, if the relationship between autonomy and outcome is seen in terms of an imbalance between job demands and abilities (i.e., decision latitude), research has consistently found that the existence of high job demands and low decision latitude is related to low job satisfaction and well-being (Karasek, 1979; Karasek et al. 1998; Jimmieson & Terry, 1993; Wall et al., 1996). As Wall et al. note, accumulated evidence shows a strong inverse relationship between autonomy and strain; but little conclusive evidence to demonstrate that the interaction between job demands and autonomy is related to strain. However, in contrast to previous research and due to the increasing use of autonomous work groups in organisations (Murphy & Smith, 1995), the present study sought to shift the focus from the autonomy of the individual to the autonomy conceded to work teams. Specifically, it sought to explore the relationship between the extent to which team members perceive their work team as responsible for the performance of work tasks and symptoms of strain.

The principle aim of the present study was to explore (a) the design of an evaluative (i.e., imbalance) response scale for the measurement of the personal desirability assigned to common work stressors, (b) the relative effect of personal desirability on the variance in symptoms of strain. Furthermore, it sought to explore the relationship between the appraisal of stressors as either (a) desirable (i.e., "Like More"), (b) undesirable (i.e., "Like Less") and (c) congruent (i.e., "About Right") and symptoms of strain. The secondary aims of the study sought to (a) explore the relationship between the perceived autonomy of the individual's work team (i.e., degree of conceded responsibility for work tasks) and strain; and (b) contrast the measurement of strain using a measure of psychological strain and a single item (i.e., generic) measure of personal stress (see Appendix E.6 & Table E.23). Thus, based on the foregoing discussion, the present study seeks to test the following explicit hypotheses:

H1 That the measurement of the personal meaning assigned to common work stressors in terms of personal desirability will account for a significant percentage of the variance in symptoms of strain.

H2 That the personal desirability of work stressors when measured in terms of (a) desirable, (b) undesirable and (c) congruence will each explain a significant percentage of the variance in symptoms of strain

H3 That increases in the desirability or undesirability of work stressors corresponds to an increase in symptoms of strain; or conversely, increases in the congruence (i.e, satisfaction) with stressors, to a decrease in symptoms of strain

H4 That the mean strain scores corresponding to the desirability or undesirability of work stressors will be significantly higher than the mean strain scores corresponding to congruence (i.e., satisfaction) with stressors.

E.3 Method

E.3.1 Participants

One Hundred and thirty five library employees from 33 Technical and Further Education (TAFE) College libraries throughout the State of Queensland (Australia) volunteered to take part in the study. The mean age of the participants was 39 years and their ages ranged from a minimum of 21 years to a maximum of 58 years. The average time of employment in TAFE libraries was 3.75 years and a range of 1 month to 16.0 years.

E.3.2 Self-Report Measures

Self-report scales were used to measure (a) the personal desirability (i.e., their evaluation of stressors) of common work of stressors; and (b) the participants perception of work team autonomy, that is, their perception of the extent to which their work team has responsibility for the performance of work tasks. In addition, self-report measures of psychological strain and personal stress were used to measure the symptoms of strain more recently experienced by the library employees participating in the present study. (see Appendix E.7, Work Design and Occupational Stress Questionnaire).

E.3.2.1 The Evaluative Measurement of Common Work Stressors

Five item evaluative scales based on the semantic differential format (Ajzen & Fishbein, 1980; Osgood et al., 1957) and the use of tripolar response anchors (e.g., Locke, 1976) were designed to measure the direction and intensity of the personal desirability assigned to role-ambiguity, role-boundary, role-insufficiency, role-overload, role-responsibility and physical environment work stressors (see Appendix E.7.3, Job Demands Evaluation Scale). With exception of the Physical Environment scale, the five item evaluative scales were formed from the items with the highest factor loadings on the six factor solution (varimax rotation) which resulted from a factor analysis of the 60

item OSI Stressor scale (see Osipow & Spokane,1987, Appendix B, p. 21). Items used in the Physical Environment scale, however, were formed from a list of environmental stressors drawn from the qualitative results of personal interviews with a small number of participants during the preliminary stages of the data collection (see Procedure E.3.4). Chapters 3.3.2, 3.3.2.1, 3.3.2.2 provide a detailed description of the theoretical basis, design and transformational issues underlying the application of evaluative response scales (i.e., tripolar differential scales) to measure both the direction and intensity of the personal meaning (i.e., personal desirability) that individual's impute to stimulus objects and events.

For each evaluative scale, a nine point differential scale based on the use of (a) neutral items, (b) the tripolar anchors "Would Like More" "About Right for Me" and "Would Like Less" and (c) the response values (+4) (+3) (+2) (+1) (0) (-1) (-2) (-3) (-4) was designed to measure the intensity and direction of the personal desirability assigned to common work stressors. The positive values (+4) (+3) (+2) corresponding to "Like More" of the stressor; the values (+1) (0) (-1) to "About Right" with the stressor; and the negative values (-2) (-3) (-4) to "Like Less" of the stressor.

E.3.2.2 Measurement of Perceived Responsibility

The perception of workgroup autonomy was measured using a modified 15 item version (Cordery, Mueller & Smith, 1991) of the original 13 item workgroup autonomy scale designed by Wall, Kemp, Jackson & Clegg (1986) - see Appendix E.7.2, Work Team Responsibility Scale. This scale is designed to measure the participants perception of the extent to which they perceive their work team has responsibility for work tasks (i.e., workgroup autonomy). Cordery et al. (1991) do not report reliability data for the modified scale. Wall et al. (1986), however, found that the alpha coefficients for the 13 item

scale ranged between 0.79 and 0.84 on three consecutive occasions. A five point response format that ranged from "Sole Responsibility" (1) to "Not At All" (5) was used to measure the perception of work team autonomy.

E.3.2.3 Measurement of Symptoms in Strain

The 10 item Psychological strain scale from the OSI inventory (Osipow & Spokane, 1983, 1987) was used to measure the frequency of psychological symptoms of strain more recently experienced by the participants (see Appendix E.7.1, Psychological Strain Scale/Personal Stress Scale). Participants used a seven point differential response scale (i.e., 3 2 1 0 -1-2-3) and response anchors which ranged from "Most of Time" (3) to "Rarely or Never" (-3) to measure their response to the scale items. Chapter 3.2.2.3.2.2 provides a more detailed description of the response format, psychometric properties and content of the Psychological Strain scale.

In addition, to assess the individual's overall level of stress, a single item "Personal Stress" scale was used to measure the individual's more general level of stress (Parkes, 1982; Peacock & Wong, 1990; Richardsen & Burke, 1991) - see Appendix E.7.1, Psychological Strain Scale/Personal Stress Scale. The item was worded: "Overall, On a Scale From 1-10, How Stressed are you Lately?" A response (0) indicating "Not Stressed At All" and a response (10) "Completely Stressed Out".

E.3.3 Design and Materials

This correlational field study required participants to answer a 60 item questionnaire. Further, due to the small size of the questionnaire and "white-collar" nature of the sample, it was considered unlikely that the responses to the scale items would be adversely influenced by various sources of response bias. For example, the comprehension of

items, discrimination effects, item acquiescence, order and carry-over effects, mental fatigue and/or boredom with the task are known sources of response bias (Anastasi, 1982; Christensen & Stoup, 1986; Oppenheim, 1966).

E.3.4 Procedure

The collection of data involved three stages of questionnaire development and data collection. In the first stage, interviews with the team leader and later the team members of a self-managed team from a selected library were used to highlight issues related to their work. From these interviews, the team members reported that the team experienced increased work pressures since moving to a self-managed structure. In particular, they reported difficulties with receiving recognition for their work and the achievement of group goals; dissatisfaction with their work-roles; and a lack of support from TAFE management.

In the second stage of data collection, a pilot questionnaire was formulated to measure (a) the personal desirability (i.e., dissatisfaction (satisfaction) with work roles) of common work stressors; (b) the perception of team autonomy; and (c) facets of psychological well-being. The questionnaire was then trialed using a volunteer team from two selected libraries; one in the presence of the research and the other posted to members of the selected team. Following this stage of data collection, the items in the desirability scale were further modified or contextualised to suit the domains of work and conditions in TAFE libraries. For example, the role-boundary item "The number of people I work with/for" was reworded to "The number of people I work for or work with at the library". In addition, with the exception of one item from the OSI Physical Environment scale, the items were replaced with items seen as more relevant to the context. Thus,

issues such as "Support for occupational health and safety"; "Computerisation or automation at the library"; "Overtime"; and "Banktime (as per award)" were included in the Physical Environment sub-scale of the desirability scale.

Finally, in the third stage of data collection, all 35 library teams in the TAFE library network were invited to participate in the research. Of these, only one team declined to participate. The inventory was then distributed personally to the respective library teams or where necessary due to the location of several country libraries, posted to the team leaders of these libraries. The completed questionnaires were then returned by mail to the researcher. Using this method, 135 library employees from 33 of the 34 TAFE library work teams returned completed questionnaires. Thus, overall, from the distribution of approximately 200 questionnaires to 34 teams, a response rate of 67.5% from the library employees working in self-manage work teams.

E.4 Results

E.4.1 Data Screening and Assumptions for Normality

Descriptive statistics, frequency plots and a series of multiple regression analyses were used to screen the raw data (n = 135) for evidence of (a) random and non-random missing values, (b) violation of the assumptions for normality and linearity and (c) the presence of univariate and multivariate outliers in the data set (Orr et al., 1991; Tabachnick & Fidell, 1989).

On average, there were 0.38 missing values (i.e., total 47) per variable across the 125 variables in data set. These ranged from a minimum of one for 23 of the variables, two for six of the variables, three for one of the variables and a maximum of seven for the evaluative item "Overtime" in the Physical Environment stressor scale. The missing val-ues were subsequent replaced with the scale response value closest to the mean

value for the variable. A further inspection of the data set identified one case with missing values for each of the 15 items in the Autonomy scale; and one case with missing values for items 30 to 45 in the Evaluative Stressor scale. Both cases were deleted from the data set.

Frequency plots explored the normality of the variables used in the measurement model. Where necessary univariate outliers and values distant from the general distribution were recoded to values less distant from the next most deviant value in an attempt to improve the normality of the data distribution (Tabachnick & Fidell, 1989). Variables with extreme skew coefficients (see Table E.1) were then transformed to approximate normal distributions using square root or logarithmic transformations of the data (Dooley et al., 1987; Stone & Hollenbeck, 1989).[E1]

In addition, a series of regression analyses explored the data for evidence of multivariate outliers. No cases was identified as a multivariate outliers in the data set. The remaining 133 cases in the data set provide the desired power of 0.80 at α 0.05 (Two Tailed) with which to detect a significant medium effect size (ES) of 0.15 from the effect of $k = 7$ independent variables (IV's) in a multiple regression model (see Cohen & Cohen, 1983, p. 118).[E2] Specifically, to achieve a desired statistical power of 0.80, requires a minimum of 102 cases (Cohen, 1992, Table 2, p.158). Furthermore, the case to IV ratio of 19:1 exceeds the requirement for a minimum of five cases to each IV in multiple regression analyses (Tabachnick & Fidell, 1989).

[E1] See footnote 1, Chapter 3.2.2.5.1, re values for skewness. This study has adopted a more conservative approach to normality and used an alpha level of 0.023 to determine maximum skewness. Skew coefficients greater than two SE's (i.e., 0.422) were considered to reject the null hypothesis for skewness.

[E2] See footnote 2, Chapter 3.2.2.5.1, for a discussion on the calculation of desired power for single set multiple regression analyses.

E.4.2 Descriptive Statistics

Descriptive statistics for n = 133 are shown in Table E.1. With the noticeable exception of the mean score (i.e., 7.902) and SD (i.e., 5.762) for the Role-Insufficiency scale the mean scores and SD's for the evaluative stressor scalers are essentially similar. The higher mean score for the insufficiency scale reflecting the wider SD and more normal distribution (i.e., skew = 0.422) of the responses to the items in this scale.

The mean score for the Autonomy scale (i.e., 52.203), however, is much higher than that expected from the observed range of responses and a normal distribution (i.e., mean $\approx$ 30.0) and reflects the significant negative skewness (i.e., skew = 0.603) of the responses to the items in the scale. That is, the responses are skewed toward the "Not At all" pole of the scale and indicates that the participants have a minimal amount of autonomy (i.e., responsibility) in the performance and management of work tasks.

The mean score for the Psychological Strain scale (i.e., 30.098) is higher than expected from a normal distribution (i.e., mean $\approx$ 24.0) and reflects the positive skewness (i.e., 0.364) of the responses to the items in the scale. In effect, the responses tend to be distributed toward the "Most of the Time" pole of the response scale and indicates that the respondents report above average frequencies for symptoms of strain. By contrast, the mean score (i.e., 4.632) and SD (i.e., 2.410) for the single item Personal Stress scale approximates that expected from a normal distribution (i.e., skew = 0.080) and the range of observed responses (i.e., 0 - 10).

With the exception of the Role-Insufficiency scale, the responses to the evaluative stressor scales are all significantly skewed in the positive direction (i.e., > 2 SE's or 0.422). The responses are in effect skewed toward the "Like More" pole of the respective response scales and can be seen to reflect constrictions in the observed range of responses to the items in the scales. As a result, either square root or logarithmic trans-

formations were used to transform the respective distributions to approximate normal distributions. Similarly, it was necessary to reduce the positive skewness of the Autonomy scale (i.e., 0.603) using a square root transformation of the response distribution.

Cronbach alpha coefficients for the evaluative stressor scales are generally moderate and range from a minimum 0.5223 to a maximum of 0.9109 for the Composite Evaluative scale. In contrast, the alpha coefficients for the 15 item Autonomy scale (i.e., 0.9496) and 10 item Psychological Strain scale (i.e., 0.8840) indicate that both scales have high internal consistency.

Table E.1
Descriptive Statistics: Stressor, Evaluative and Strain Scales

Scale	Mean	SD	Scale Range#	Observed Range	Skew	Tran/Var Skew##	Alpha
Evaluative Stressor							
Role-Ambiguity	2.993	3.661	----	0 - 15	1.558	0.408	0.7753
Role-Boundary	4.128	4.493	----	0 - 19	1.365	0.052	0.7255
Role-Insufficiency	7.902	5.762	0 - 20	0 - 20	0.422	----	0.8467
Role-Overload	3.947	4.144	----	0 - 18	1.190	0.021	0.7573
Role-Responsibility	2.962	3.436	----	0 - 15	1.256	0.275	0.7482
Physical Environment	3.917	3.184	0 - 16#	0 - 14	1.003	0.219	0.5223
Composite Evaluative+	25.955	10.523	0 - 116	0 - 83	1.067	0.090	0.9109
Job Characteristic							
Autonomy	52.203	15.873	15 - 75	15 -75	-0.603	0.364	0.9496
Strain							
Psychological	30.098	10.523	10 - 70	10 - 58	0.364	----	0.8840
Personal Stress+	4.632	2.410	0 - 10	0 - 10	0.080	----	----

Note: n = 133; Composite+ - 29 Item Scale Formed From Items Used in Sub-Scales; Tran/Var Skew## - Variable Transformed to Reduce Skewness; Scale Range# - Variables Removed to Improve the Reliability or Face Validity of the Scale; Personal Stress+ - Single Item Scale

E.4.2.1 Evaluative Response Scale

The tripolar Personal Desirability scale enables the extraction of three response scales which reflect the response anchors of the cognitive imbalance; that is, the response anchors "Like More" "Like Less" and "About Right". Table E.2 shows the frequency of

responses to the "Like More" (i.e., response values "4" "3" "2") "About Right" (i.e., response values "1" "0" "-1") and "Like Less" (i.e., response values "-2" "-3" "-4") response anchors of the Evaluative (i.e., imbalance) response scale; and Table E.5, the descriptive data related to the response anchors of the evaluative response scales. Further, to equalise the scale range for each scale, the response values corresponding to each response anchor were recoded to the following values. The "Like More" scale, to the response values 4 3 2 0 0 0 0 0 0; the "About Right" scale, to the values 0 0 0 1 4 1 0 0 0; and the "Like Less" scale, to the values 0 0 0 0 0 0 2 3 4.

Distribution of Responses

The majority of responses to the Evaluative Stressor scales fall in the "About Right" option of the respective scales. As the Table E.2 indicates, 74.0% of the total responses (i.e., 3857) fall within this region of the scale; a much lower 21.39% within the "Like More" anchor of the scale; and only 4.62% of the total responses in the "Like Less" response anchor of the scale. Furthermore, when the response distribution is compared to that expected from a normal distribution, there is an excess of approximately 6.00% in the number of responses for the "About Right" anchor of the scale, an excess of approximately 5.4% for "Like More" and a shortfall of approximately 11.4% for the "Like Less" anchor of the scale. That is, for a normal distribution, 68.0% of the responses would be expected to fall in the "About Right" anchor of the scale and 16.0% in both the "Like More" and "Like Less" anchors of the scale.

When related to the respective evaluative stressor scales, the percentage of responses for "About Right" range from a low 53.38% (i.e., Role-Insufficiency) to a maximum of 84.51% for the Role-Ambiguity scale. In contrast, responses to the "Like More" anchor of the scale range from a low 9.62% (Role-Responsibility) to a maximum of 46.62% for the Role-Insufficiency scale; and those for the "like Less" anchor of the scale, from zero

for the Role-Insufficiency scale to a maximum of 7.97% for the Role-Insufficiency scale. Thus, on the basis of this distribution, the table indicates that the response distributions for the "Like Less" anchors of the Role-Ambiguity (i.e., 0.75%), Role-Insufficiency (i.e., 0.00%) and Physical Environment (i.e., 3.76%) scales do not attract enough responses to form a normal distribution of the responses. Furthermore, contrary to the expected U distribution of the responses, it indicates that the response to items in these scales is essentially linear.

Furthermore, as shown in Table E.2, Chi-Square (X^2) goodness of fit statistics for each scale indicate that the distribution of responses to each scale is not by chance alone. That is, they show that some underlying factor in common with the scale has determined the individual's response to the items in the respective scales.

Table E.2
Evaluative Stressor Response Scales: Response Distribution Comparisons

Scale Response	Like More+		About Right+		Like Less+		Goodness of Fit
Variables	**n**	**%**	**n**	**%**	**n**	**%**	χ^2
Role-Ambiguity	99	14.89	561	84.51	5	0.75	799.12, p. .0000
Role-Boundary	110	16.54	506	74.59	49	7.37	555.47, p. .0000
Role-Insufficiency	310	46.62	355	53.38	0	0.00	337.07, p. .0000
Role-Overload	104	15.64	510	76.70	51	7.67	658.91, p. .0000
Role-Responsibility	64	9.62	548	82.41	53	7.97	720.91, p. .0000
Physical Environment#	138	25.94	374	70.30	20	3.76	366.42, p. .0000
Total Responses	825	21.39%	2854	74.00%	178	4.62%	3017.65, p. .0000
Average Responses	137.50	21.54%	474.17	73.65%	29.67	4.59%	----

Note: n=133; Response Scale Options: Like More+ 4 3 2; About Right+ 1 0 -1; Like Less+ -2 -3 -4;
Total Responses RA RB RI RO RS Scales = 665; Physical Environment# = 532 (i.e., 4 item scale).

Descriptive Statistics

Mean scores for the "Like More" scales are much less than those expected from the observed range of responses; those for the "About Right" somewhat higher than the expected mean; and those for the "Like Less" scale, substantially less than the expected value (Table E.3). In each case, the mean scores reflect the effect of skewness on the

distribution of the responses to the respective scales. That is, the distributions for the "Like More" and "Like Less" scales tend to be tied or gather toward to the "About Right" pole of each scale.

The SD's for the "Like More" "About Right" and "Like Less" scales largely reflect the expected values for a normal distribution. Furthermore, they indicate a wide variability in the range of response values to the respective scales. For instance, the expected values for the composite evaluative scales "Like More" (i.e., 16.26), "About Right" (i.e., 12.50) and "Like Less" (i.e., 5.5) correspond to SD's of 15.356, 12.035 and 5.455 respectively.

With the exception of the "About Right" Role-Insufficiency and Composite Evaluative scales, skewness values for the scales are all significant. Subsequent square root, logarithmic and inflection transformations, however, were not able to transform the distributions of all the scales to approximate normality. In particular, with the exception of the Composite Evaluative scale, skew values for the "Like Less" scales are all greater than one and two of the scales remain excessively skewed. As a result, the "Like Less" Role-Boundary and Physical Environment scales were dropped from subsequent analyses; and the "Like Less" Role-Insufficiency scale dropped as there were no responses to the items in the scale (see Table E.2).

Cronbach alpha coefficients for the scales used in subsequent analyses show a wide variability and range from low to high reliability. Those for the "Like More" scale ranging from a low 0.5063 to a high 0.8768; those for the "About Right" scale ranging from a low 0.4698 to a high 0.8969; and those for the "Like Less" scale from a low 0.4654 to a maximum of 0.7137 for the composite scale.

Table E.3
Descriptive Statistics: "Like More" "About Right" and "Like Less" Evaluative Response scales

Scale	Mean	SD	Scale Range+	Observed Range	Skew	Tran/Var Skew++	Alpha
			"Like More" Response Scale				
Evaluative Stressor							
Role-Ambiguity	3.396	2.000	0 - 20	0 - 14	1.975	0.960	.7478
Role-Boundary	2.383	3.064	0 - 20	0 - 12	1.252	0.415	.5227
Role-Insufficiency	6.970	6.103	0 - 20	0 - 20	0.577	0.030	.8336
Role-Overload	2.120	3.181	0 - 20	0 - 15	1.891	0.681	.6433
Role-Responsibility	1.158	2.315	0 - 20	0 - 11	2.255	-1.065	.7053
Physical Environment	3.000	3.294	0 - 16	0 - 15	1.343	0.430	.5063
Composite Evaluative#	17.692	15.356	0 - 116	0 - 65	1.174	0.253	.8768
			"About Right" Response Scale				
Evaluative Stressor							
Role-Ambiguity	14.301	5.704	0 - 20	0 - 20	-0.798	-0.087	.7646
Role-Boundary	13.571	5.901	0 - 20	0 - 20	-0.574	0.027	.6929
Role-Insufficiency	7.880	6.882	0 - 20	0 - 20	0.532	0.044	.8170
Role-Overload	12.835	6.209	0 - 20	0 - 20	-0.366	----	.7459
Role-Responsibility	14.284	5.724	0 - 20	0 - 20	-0.619	0.145	.7208
Physical Environment	9.511	4.463	0 - 16	0 - 16	-0.320	----	.4698
Composite Evaluative#	72.398	25.397	0 - 116	15 - 116	-0.223	----	.8969
			"Like Less" Response Scale				
Evaluative Stressor							
Role-Ambiguity	0.098	0.626	0 - 20	0 - 6	7.641	6.304	.5019+
Role-Boundary	1.135	2.319	0 - 20	0 - 12	2.418	-1.091	.4654
Role-Insufficiency	----	----	----	----	----	----	---- +
Role-Overload	0.962	2.155	0 - 20	0 - 12	2.591	-1.385	.6143
Role-Responsibility	0.970	2.045	0 - 20	0 - 11	2.519	-1.183	.6561
Physical Environment	0.376	0.974	0 - 16	0 - 4	2.529	-2.067	.0301
Composite Evaluative#	3.594	5.455	0 - 116	0 - 22	1.784	-0.122	.7137+

Note: n = 133; #Composite Scale Formed From Items Used in Sub-Scales; Tran/Var Skew++ - Variable Transformed to Reduce Skewness; Scale Range+ - Variables Removed to Improve the Reliability or Face Validity of the Scale; Response Scale 4 3 2 1 0 -1 -2 -3 -4 Recoded: a) "Like More" - 4 3 2 0 0 0 0 0 0; b) "About Right" 0 0 0 1 4 1 0 0 0; c) "Like Less" 0 0 0 0 0 0 2 3 4; Alpha+ - Items Removed From Cronbach Alpha Calculation Due Zero Variance: RA - 2 Items, RI - 5 Items, Eval Comp - 8 Items.

E.4.3 Scale Correlations

Pearson zero-order correlations (n = 133) for the Evaluative Stressor and Autonomy scales with dimensions of strain are shown in Table E.4; those for the transformed Evaluative Stressor and Autonomy scales with dimensions of strain in Table E.5; a comparison of the original and transformed (a) Evaluative Stressor and (b) Autonomy

scales with dimensions of strain in Table E.6; those for the evaluative "Like More" "About Right" and "Like Less" stressor scales in Tables E.10 to E.12; and those between the Composite Evaluative scales and dimensions of strain in Table E.13.

The sample size n = 133 provides a desired minimum power of 0.80 at α .05 (Two Tailed) with which to detect a medium ES of r = 0.30. As the tables for power provided by Cohen (1992) indicate, to detect a medium ES or population r of 0.30 at α .05 (Two Tailed) requires a minimum sample size of n = 85 (see Table 2, p. 158) to achieve a minimum power of 0.80. The correlations reflect two-tailed tests for significance at $\alpha \leq$ 0.05* or 0.01** as indicated.

E.4.3.1 Evaluative Response Scale

Correlations between the evaluative response scales and both dimensions of strain are all significant (see Table E.4). Those with the Psychological Strain scale ranging from a low 0.18* (i.e., Role-Responsibility scale) to a moderate 0.36** with the Role-Ambiguity scale; and those with the Personal Stress scale ranging from a low 0.25** (i.e., Role-Responsibility) to a moderate 0.43** with the Composite Evaluative scale. Conversely, correlations between the Autonomy scale and strain are not significant.

Interscale correlations between the evaluative stressor scales indicate the existence of a moderate overlap or some redundancy between the scales. These range from a minimum 0.32** between role-ambiguity and physical environment stressors to a maximum of 0.63** between role-boundary stressors and role-overload stressors. As such, the scales may be seen as only moderately independent in nature. Furthermore, the correlations are all below the 0.70 criterion for bivariate redundancy (Tabachnick & Fidell, 1989). As such, this indicates that the evaluative scales may be used in multivariate analyses. In contrast, correlations with the Composite Evaluative scale tend to be high and range from a minimum 0.63* for the Physical Environment scale to a maximum of

0.83** for the relationship with the Role-Boundary scale. Thus, overall, the correlations suggests that the evaluative dimensions may in effect reduce to a smaller number of dimensions; or alternatively, perhaps best represented by a singe dimension. Conversely, correlations between the evaluative stressor scales and the Autonomy scale are all not significant. As a result, the scales may be seen as essentially independent predictors of strain

Table E.4
Correlations: Original Scales - Evaluative Stressors and Autonomy With Dimensions of Strain

Scale	1	2	3	4	5	6	7	8	9
Evaluative Stressor									
1. Role-Ambiguity	----								
2. Role-Boundary	0.47**	----							
3. Role-Insufficiency	0.43**	0.60**	----						
4. Role-Overload	0.58**	0.63**	0.57**	----					
5. Role-Responsibility	0.39**	0.47	0.48**	0.49**	----				
6. Physical Environ	0.32**	0.47**	0.34**	0.45**	0.40**	----			
7. Composite Evaluative	0.68**	0.83**	0..80**	0.82**	0.70**	0.63**	----		
Job Characteristic									
8. Autonomy	-0.06	0.01	-0.01	-.12	-.01	0.16	-0.04	----	
Strain									
9. Psychological	0.36**	0.30**	0.30**	0.23**	0.18*	0.19*	0.35**	0.04	----
10. Personal Stress	0.36**	0.38**	0.34**	0.34**	0.25**	0.29**	0.43**	0.10	0.77**

Note: n = 133; *p ≤ .05, **p ≤ .01 (Two-Tail)

The Psychological and Personal Stress scales, however, correlate a high 0.77** and suggests that these dimensions of strain are essentially multicollinear in nature; that is, it indicates that the correlation carries redundant information which is common two both variables. However, due the generic nature of the single item Personal Stress scale, there is in effect no basis by which to conclude that this scale is the more valid measure of strain. Both scales, however, may be used to measure symptoms of strain.

Transformed Scale Correlations

Table E.5 shows the correlations between the transformed evaluative stressor scales and Autonomy scale with strain. As the table indicates, the correlations between the transformed evaluative scales and strain are essentially similar to those for the original evaluative scales. Similarly, the correlations between the transformed Autonomy scale and strain are not significant.

Table E.5
Correlations: Transformed and Original Scales - Evaluative Stressors and Autonomy With Dimensions of Strain

Scale	1	2	3	4	5	6	7	8	9
Evaluative Stressor									
1. Role-Ambiguity#	----								
2. Role-Boundary#	0.48**	----							
3. Role-Insufficiency	0.40**	0.57**	----						
4. Role-Overload#	0.57**	0.54**	0.51**	----					
5. Role-Responsibility#	0.44**	0.43**	0.49**	0.51**	----				
6. Physical Environment#	0.42**	0.41**	0.33**	0.47**	0.43**	----			
7. Composite Evaluative#	0.67**	0.76**	0.81**	0.79**	0.71**	0.64**	----		
Job Characteristic									
8. Autonomy#	0.01	-0.03	0.08	0.11	0.02	-0.15	0.04	----	
Strain									
9. Psychological	0.36**	0.35**	0.30**	0.23**	0.23**	0.20*	0.37**	-0.06	----
10. Personal Stress	0.37**	0.43**	0.34**	0.35**	0.30**	0.29**	0.46**	-0.13	0.77**

Note: n = 133; *p ≤ .05, **p ≤ .01 (Two-Tail); # Transformed Scale

In addition, similar to those for the original scales, the interscale correlations between the transformed evaluative scales are all significant and essentially moderate in magnitude. These range from a minimum 0.33** between the Role-Insufficiency and Physical Environment scales to a maximum of 0.57** between the Role-Ambiguity and Role-Overload scales and indicate that the moderate overlap of the scales contains redundant information. Therefore, it is likely that the commonality of the evaluative scales may in effect reduce to a smaller number of dimensions.

A subsequent factor analysis of the evaluative stressor scales using principal components analysis to extract factors and oblique rotation of the factor solution (i.e., assumes correlated factors) was used in an attempt to reduce the redundancy or commonality between the scales (see section E.4.3.2).

Comparison Of Original and Transformed Scales

Table E.6 compares the correlations between the original and transformed scales (i.e., evaluative stressor & autonomy) and dimensions of strain (see Table E.1). As the table shows, the effect of transformation in the main acts to increase the correlations for both the evaluative stressor and autonomy scales with strain. For instance, the correlations between the original and transformed Role-Overload scales and psychological strain increase from 0.23** to 0.34**; and those with personal stress from 0.23** to 0.35**. Thus, the data indicates that the use of skewed variables results in deflated correlations with both dimensions of strain. As a result, the lower correlations act to limit the maximum variance which may be explained by a regression model. For instance, the

Table E.6
Correlation Comparison: Original and Transformed Evaluative Work Role Stressor and Autonomy Scales With Dimensions of Strain

Transformed Scales	Strain			
	Psychological		Personal Stress#	
	Original+	Transformed+	Original+	Transformed+
Evaluative Stressor				
Role-Ambiguity	0.36**	0.36**	0.36**	0.37**
Role-Boundary	0.30**	0.35**	0.38**	0.43**
Role-Overload	0.23**	0.34**	0.23**	0.35**
Role-Responsibility	0.18*	0.23**	0.25**	0.30**
Physical Environment	0.19*	0.20*	0.29**	0.29**
Composite Evaluative	0.35**	0.37**	0.43**	0.46**
Job Characteristic				
Autonomy	0.04	-0.05	0.10	-0.13

Note: n = 133; *p ≤ .05, **p ≤ .01 (two-tail); Personal Stress# - Single Item Scale; +Original/Transformed - Original and Transformed Evaluative Stressor and Autonomy Scales.

variance explained by the correlation between the transformed Role-Overload scale and personal stress decreases from 11.6% (i.e., 0.34^2) to 5.3% (i.e., 0.23^2) when related to the original Role-Overload scale. Furthermore, due to the non-significant correlations between autonomy and both dimensions of strain, the scale was eliminated from subsequent analyses.

E.4.3.2 Factor Evaluative Stressor Scales

A case to variable ratio of 4.59:1 was considered insufficient to satisfy the minimum requirements for a factor analysis of the 29 items used in evaluative stressor scales (Cox & Cox, 1991; Smith et al., 1993). The 22.17:1 case to variable ratio for the evaluative stressor scales, however, provides the necessary information with which to conduct a factor analysis of the evaluative scales. The factor loadings on the four factor solution that resulted from a principal components analysis and oblique rotation of the factor solution are shown in Table E.7 In addition, the table indicates that (a) both Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) Test of sampling adequacy verify the adequacy of the data in the correlation matrix; and (b) the reproduced correlations residuals, that the rotated factor solution reflects the latent structure of the correlation matrix (Smith et al., 1993; Tabachnick & Fidell, 1989).

The table indicates that four correlated factors best represent the latent structure underlying the evaluative stressor scales. The scales Role-Insufficiency and Role-Boundary loading on factor one; Physical environment on factor two; Role-Ambiguity and Role-Overload on factor three; and Role-Responsibility on factor four. Furthermore, it shows that (a) cross loadings on the factors are all less than 0.3; and (b) the four factor solution accounts for 86.70% of the variance in the model. Factor one was termed Boundary/Insufficiency; factor two, Physical Environment; factor three, Ambiguity/

Overload; and factor four, Responsibility. From this solution, factor evaluative scales were formed from the scales which load on the respective factors. Descriptive data for the factor scales is shown in Table E.8 and correlations related to the scales in Table E.9.

Table E.7
Factor Analysis - Principal Components Extraction: Evaluative Stressor Scales

Oblique Rotation	Pattern Matrix Factor Loadings+			
Variables	Factor 1	Factor 2	Factor 3	Factor 4
Role-Insufficiency	0.8890			
Role-Boundary	0.8703			
Physical Environment		0.9958		
Role-Ambiguity			-0.9813	
Role-Overload			-0.5502	
Role-Responsibility				-0.9539
Eigen Values	3.3342	0.7180	0.5937	0.5570
Cumulative Variance	55.60%	67.50%	77.40%	86.70%

Note: n = 133; +Factor loadings 0.3 or greater shown; KMO = 0.8612; Bartlett Test of Sphericity = 267.9054, p. .0000; Reproduced Correlations Residuals - 7 (i.e., 46%) > 0.05

Descriptive Statistics

The mean scores for the factor evaluative scales are all below the expected value for a normal distribution and the observed range of the responses. In each case, the reduced mean score, can be seen to reflect the effect of positive skewness in the distributions for the respective scales. For instance, the mean score for Ambiguity/Overload scale (i.e. 6.895) is approximately 50.0% lower than the expected value (i.e., 14.0) for the scale and is due to (a) the significant positive skew (i.e., 1.183) for the scale and (b) constrictions in the observed range of responses (i.e., 0 -14).

With the exception of the SD for the Composite Factor scale (i.e. 10.523) which is approximately 50.0% below the expected value (i.e., 83/4 = 20.75), the SD's for the scales approximate the expected value from the observed range of responses. The lower SD for the composite scale reflecting the (a) the significant positive skewness for the scale (i.e., 1.067) and constriction in the observed range of responses which are 29.0% below the range of the scale (i.e., 0 - 116).

Table E.8
Descriptive Statistics: Factor Evaluative Scales - Evaluative Work Role Stressor Scales

Factor Evaluative Scale	Mean	SD	Scale Range	Observed Range	Skew	T/Var Skew++	Alpha
Boundary/Insufficiency (10)	12.030	9.196	0 - 40	0 - 39	0.793	-0.036	.8591
Physical Environment (4)	3.917	3.184	0 - 16	0 - 14	1.003	0.219	.5223
Ambiguity/Overload (10)	6.895	6.784	0 - 40	0 - 28	1.183	-0.066	.8369
Responsibility (5)	2.947	3.387	0 - 20	0 - 14	1.180	0.344	.7482
Composite Factor* (29)	25.995	10.523	0 - 116	0 - 83	1.067	0.090	.9109

Note: n = 132; Factor Composite - Scale Formed from Factor Stressor Scales; T/Var Skew++ - Variable Transformed to Reduce Skewness; ( ) Number of Items in Scale.

Thus, taken overall and, in spite of being significantly skewed, the SD's for the individual scales reflect a wide variability in the range of responses. The variability for the composite scale, however, is in effect substantially constricted; the SD for the scale (i.e.,10.523) is approximately 64.0% below that expected from the range of the scale and a normal distribution (i.e., 0 - 116/4 = 29).

Skewness values indicate that the factor evaluative scales are all significantly skewed in the positive direction and reflects in part, constrictions in the range of responses to the items in the respective scales. In effect, the scales are all skewed toward the "About Right" or "in balance" pole of the response scale. Square root and logarithmic transformations were used to transform the distributions to approximate normal distributions.

Cronbach alpha coefficients for scales indicate that the individual scales have moderate reliability. The coefficients ranging from a minimum 0.5223 for the four item Physical Environment scale to maximum of 0.8591 for the 10 item Boundary/Insufficiency scale. The alpha coefficient for the Composite Factor scale (as is the other descriptive data) is identical to the value reported in Table E.1.

Correlations

Correlations between the factor evaluative scales and strain are all significant (Table E.9). Those with the Psychological Strain scale ranging from a low of 0.20* for the correlation with the Physical Environment scale to a maximum of 0.35** for the correlation with the Boundary/Insufficiency scale and 0.37** for the composite scale. By contrast, those with the Personal Stress scale are slightly higher and range from a minimum 0.29** to a maximum of 0.42** for the correlation with the Ambiguity/Overload scale and 0.46** with the Composite factor scale.

Interscale correlations are all significant and moderate in magnitude. They range from a minimum of 0.40** for the correlation between the Boundary/Insufficiency and Physical environment scales to a maximum of 0.60** between the Boundary/Insufficiency and Ambiguity/Overload scales. Accordingly, there is evidence of a moderate overlap or some degree of redundancy (i.e., commonality) in the nature of the information measured by the factor evaluative scales. That is, the correlations carry information which is common to both variables.

Correlations between the Autonomy scale and strain, however, are both not significant. Similarly, correlations between the Factor Evaluative scales and Autonomy are not significant.

Table E.9
Correlations: Factor Evaluative Scales - Evaluative Work Role Stressors and Autonomy With Dimensions of Strain

Scale	1	2	3	4	5	6
Evaluative Stressor						
1. Boundary/Insufficiency#	----					
2. Physical Environment#	0.40**	----				
3. Ambiguity/Overload#	0.60**	0.50**	----			
4. Responsibility#	0.49**	0.42**	0.56**	----		
5. Composite Factor#	0.88**	0.64**	0.84**	0.71**	----	
Job Characteristic						
6. Autonomy#	0.05	-0.15	0.09	0.02	0.04	----
Strain						
7. Psychological	0.35**	0.20*	0.33**	0.23**	0.37**	-0.06
8. Personal Stress	0.41**	0.29**	0.42**	0.29**	0.46**	-0.13

Note: n = 133; *p. ≤ .05, **p. ≤ .01 (Two-Tail); # Transformed Scale

E.4.3.3 Evaluative Stressor Scale: Response Anchor Correlations

Tables E.10 to E.12 show the correlations for the "Would Like More" "About Right" and "Would Like Less" anchors of the Evaluative Stressor scale with dimensions of strain; and Table E.13, correlations for the Evaluative Stressor, "Like More" "About Right" and "Like Less" composite scales with dimensions of strain.

"Like More" Correlations

With the exception of the Role-Responsibility and Physical Environment scales, correlations between the Evaluative "Like More" Stressor scales and strain are significant (see Table E.10). Those with the Psychological Strain scale ranging from a low 0.18* for the correlation with the Role-Overload scale to a maximum of 0.37** for the correlation with the Role-Ambiguity scale; and those for Personal Stress, ranging from a slightly higher 0.27** to a maximum of 0.42** for the correlation with the Composite Evaluative scale.

Table E.10
Correlations: "Would Like More" Evaluative Stressors With Dimensions of Strain

Scale	1	2	3	4	5	6	7
Evaluative Stressor							
1. Role-Ambiguity#	----						
2. Role-Boundary#	0.42**	----					
3. Role-Insufficiency	0.37**	0.50**	----				
4. Role-Overload#	0.44**	0.45**	0.56**	----			
5. Role-Responsibility#	-0.29**	-0.38**	-0.37**	-0.43**	----		
6. Physical Environment#	0.33**	0.37**	0.31**	0.32**	-0.24**	----	
7. Composite Evaluative#	0.64**	0.71**	0.83*	0.73**	-0.55**	0.58**	----
Strain							
9. Psychological	0.37**	0.25**	0.30**	0.18*	-0.08	0.14	0.35**
10. Personal Stress	0.37**	0.34**	0.34**	0.27**	-0.15	0.22*	0.42**

Note: n = 133; *p ≤ .05, **p ≤ .01 (Two-Tail); (a) # Transformed Scale; (b) Due to the Effect of Transformation, the Direction of Correlations May Be Reversed.

Correlations between the "Like More" scales are all significant and tend to be low in magnitude. They range from a minimum of -0.24** for the correlation between the Responsibility and Physical Environment scales to a maximum of 0.56** between the Insufficiency and Overload scales. Furthermore, nine of the correlations (i.e., 60%) are less than 0.40** and only two of the 15 ≥ 0.50**. As a result, the scales may be seen as relatively independent in nature. By contrast, the correlations with the Composite Evaluative scale are generally moderate in nature and range from a minimum -0.55** for the correlation with Role-Responsibility to a maximum of 0.83** for the correlation with the Role-Insufficiency scale. That is, the scale carries information which reflects each of the evaluative stressor scales and therefore may be used as a valid substitute for the "Like More" stressor scales.

"About Right" Correlations

Although tending toward low, correlations between the "About Right" component of the Evaluative Stressor scale and strain are all significant (see Table E.11). Those with the Psychological Strain scale ranging from a minimum of -0.19* with Physical Environment to maximum of -0.38** with the Composite Evaluative scale; and those with Personal Stress, from a slightly higher minimum of -0.23** to a maximum of -0.44** with the Composite Evaluative scale. Furthermore, the inverse correlations between the Role-Overload, Physical Environment and Composite Evaluative scales with strain imply that increases in "About Right" with stressors are related to a reduction in symptoms of strain (see note Table E.13).

Table E.11
Correlations: "About Right For Me" Evaluative Stressors With Dimensions of Strain

Scale	1	2	3	4	5	6	7
Evaluative Stressor							
1. Role-Ambiguity#	----						
2. Role-Boundary#	0.45**	----					
3. Role-Insufficiency#	-0.39**	-0.54**	----				
4. Role-Overload	0.53**	-0.54**	0.49**	----			
5. Role-Responsibility#	0.44**	0.43**	-0.41**	-0.51**	----		
6. Physical Environment	-0.40**	-0.40**	0.35**	0.44**	-0.37**	----	
7. Composite Evaluative	-0.70**	-0.76**	-0.75**	0.81**	-0.72**	0.63**	----
Strain							
9. Psychological	0.35**	0.35**	-0.31**	-0.27**	0.21*	-0.19*	-0.38**
10. Personal Stress	0.34**	0.42**	-0.34**	-0.36**	0.28**	-0.23**	-0.44**

Note: n = 133; *p. ≤ .05, **p. ≤ .01 (Two-Tail); (a) # Transformed Scale; (b) The Positive Correlations With Strain Reflect the Effect of Data Transformations: The Positive Correlations Should be Read as Negative.

In addition, the correlations between the "About Right" scales are all significant and tend to be moderate in nature. These range from a minimum of 0.35** to a maximum of -0.54** between (a) the Role-Boundary and Role-Insufficiency scales and (b) the Role-Boundary and Role-Overload scales. Further, 12 of the correlations (i.e., 80.00%) are ≥ 0.40** and indicates that each of the correlations carries a moderate amount of

redundant information; that is, they carry information which is common to both variables. However, the correlations are all substantially below than the 0.7 criterion for redundancy and therefore may be used in multiple regression analyses (Tabachnick & Fidell, 1989). Furthermore, correlations with the Composite Evaluative scale are all moderate and range from 0.63** with the Physical Environment scale to a maximum of -0.81** with the Role-Overload scale. This suggests, that (a) the composite scale carries information which reflects the underlying Evaluative Stressor scales and (b) may be used to replace the evaluative stressor scales in regression analyses.

"Like Less" Correlations

With the exception of those for Role-Ambiguity and Role-Insufficiency scales, the correlations between the "Like Less" evaluative scales and strain tend to be low and significant (see Table E.12). Those for Psychological Strain ranging from a low -0.19* to a maximum of -0.34** for the correlation with Role-Boundary stressors; and those for Personal Stress, from a low -0.20* to a maximum of -0.40 for the correlation with the composite scale. However, with the exception of the correlation between the composite scale and strain, the correlations with strain may in effect be somewhat deflated as the response distributions for the individual "Like Less" scales are all significantly skewed in the negative direction (see Table E.3)

The interscale correlations tend to be low or not significant. The six significant correlations (i.e., 40.0%) ranging from a low -0.21* to a maximum of 0.46** between the Role-Overload and Role-Responsibility scales. Thus, based on these correlations, the "Like Less" scales may be seen as relatively independent in nature. By contrast, the correlations with the composite scale range from a low -0.21* for role-ambiguity stressors to a moderate 0.66** for the correlation with role-boundary stressors. In other words, the composite scale does not carry information which reflects the underlying nature of

the "Like Less" scales. The composite scale, therefore, should not be used as a valid substitute for the "Like Less" scales. The Role-Boundary, Role-Overload and Role-Responsibility scales are in effect the only scales which may most usefully be used as predictors of strain.

Table E.12
Correlations: "Would Like Less" Evaluative Stressors With Dimensions of Strain

Scale	1	2	3	4	5	6	7
Evaluative Stressor							
1. Role-Ambiguity#	----						
2. Role-Boundary#	-0.21*	----					
3. Role-Insufficiency##	----	----	----				
4. Role-Overload#	-0.24**	0.38**	----	----			
5. Role Responsibility#	-0.22**	0.33**	----	0.46**	----		
6. Physical Environment#	-0.02	0.10	----	0.05	0.07	----	
7. Composite Evaluative#	-0.21*	0.66**	----	0.62**	0.63**	0.42**	----
Strain							
9. Psychological	0.01	-0.34**	----	-0.19*	-0.27**	-0.19*	-0.32**
10. Personal Stress	0.05	-0.37**	----	-0.31**	-0.24**	-0.20*	-0.40**

Note: n = 133; *p. ≤ .05, **p. ≤ .01 (Two-Tail); (a) # Transformed Scale; (b) Due to the Effect of Transformation, the Direction of Correlations May Be Reversed; (c) ## All Scores Zero

Composite Scale Correlations

Correlations between the Composite Evaluative scales and strain are all significant and tend to be moderate in magnitude (see Table E.13). Those with the Psychological Strain scale ranging from a minimum -0.32** to a maximum of -0.38**; and those with Personal stress, ranging from a slightly higher minimum of -0.40** to a maximum of 0.46** with the Evaluative Stressor scale.

Correlations between the composite scales, however, range from moderate to multi-collinear in nature. In particular, those between the Evaluative Stressor and "Like More" (i.e., 0.93**) and "About Right" (-0.94**) Composite scales approach singularity and suggest that they both in effect carry identical information. Similarly, the -0.81**

correlation between the "Like More" and "About Right" Composite scales indicates that these scales are essentially multicollinear in nature and therefore that one of the scales is in effect redundant. In sum, due to the redundancy of either the "Like More" or "About Right' scales, neither should not be used as predictors of strain as the information carried by the correlations is essentially singular in nature.

Table E.13
Correlations: Composite Evaluative Scales With Dimensions of Strain

Scale	1	2	3	4
Composite Evaluative				
1. "Evaluative Stressor"#	----			
2. "Would Like More"#	0.93**	----		
3. "Would Like Less"#	-0.57**	-0.44**	----	
4. "About Right For Me"	-0.94**	-0.81**	0.52**	----
Strain				
5. Psychological	0.37**	0.33**	-0.32**	-0.38**
6. Personal Stress	0.46**	0.44**	-0.40**	-0.44**

Note: n = 133; *p. ≤ .05, **p. ≤ .01 (Two-Tail); # Transformed Scale

Correlations with the "Like Less" Composite scale are moderate and suggests that this scale is relatively independent in nature. However, due to the low number of responses for the scale (see Table E.2), the correlation is in effect misleading as the scale does not embody or reflect the nature of all the "Like Less" scales (see Tables E.3 & E.12). Thus, since the scale has poor convergent validity it should not be used as a generic predictor of strain.

E.4.4 Regression Analyses

Tables E.14 to E.17 summarise the results from a series of backward regression models which explore the relative effect of the personal desirability assigned to common work role stressors (i.e., recognition of common stressors) on symptoms of strain.

Table E.14 shows the results from a series of models which explored the relative effect of (a) evaluative stressor scales and (b) Composite Evaluative scale on psychological strain and personal stress; and Table E.15, the results from analyses which explored the relative effect of the factor evaluative scales on symptoms of strain. In addition, Tables E.16 and E.17 present a summary of the results from a series of regression analyses which explored the relative effect of personal desirability in terms of "Like More" "About Right" and "Like Less" on symptoms of psychological strain and personal stress. For each regression model, an alpha pout at $\geq .051$ (Two Tailed) is used to effect the removal of a variable from the regression model.

Evaluative Stressor Scales

Table E.14 shows that the appraisal of role-ambiguity and role-boundary stressors in terms of personal desirability explains a moderate 17.17% (15.89% adj) of the variance in symptoms of psychological strain. When related to personal stress, however, the relative significance of the predictors is reversed; the personal desirability assigned to role-boundary and role-ambiguity stressors explains an increased 22.19% (20.99% adj) of the variance in personal stress. In contrast, when symptoms of strain are related to a generic measure of personal desirability, the composite measure of personal desirability predicts a somewhat lower 13.83% (13.17%) of the variance in psychological strain; and a slightly reduced 21.37% (20.77%) of the variance in symptoms of personal stress.

Thus, overall, the analyses indicate (a) that a more specific focus on the personal desirability of work stressors provides a more instructive insight to the nature and role of personal desirability in strain related outcomes; and (b) explains a higher percentage of the variance in strain. Furthermore, there is support for the hypothesis (H1) that the personal desirability of work stressors would add significant information to the explanation of strain.

Table E.14
Backward Regression: Psychological Strain and Personal Stress on Evaluative Role Stressor Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
		Evaluative Role Stressor Scales				
Psychological Strain	Role-Ambiguity#	17.17%	15.89%	0.2545	2.799	.0059
	Role-Boundary#			0.2272	2.499	.0137
Mult R=.4143; SE 9.6509; F(2,130) 13.4720, p. 0000						
Personal Stress+	Role-Boundary#	22.19%	20.99%	0.3266	3.706	.0003
	Role-Ambiguity#			0.2175	2.468	.0149
Mult R=.4711; SE 2.1426; F(2,130) 18.5362, p. 0000						
		Composite Evaluative Role Stressor Scale				
Psychological Strain	Composite Evaluative#	13.83%	13.17%	0.3718	4.584	.0000
Mult R=.3718; SE 9.8060; F(1,131) 21.0172, p. 0000						
Personal Stress+	Composite Evaluative#	21.37%	20.77%	0.4622	5.966	.0000
Mult R=.4622; SE 2.1456; F(1,131) 35.5955, p. 0000						

Note: pout ≥ .051 (two-tail); # Transformed Scale; Personal Stress+ - Single Item Scale

Factor Evaluative Scales

With respect to the psychological strain model (see Table E.15), the personal desirability of boundary/Insufficiency work stressors explained a low 12.10% (11.43% adj) of the variance in psychological symptoms of strain. When related to personal stress, however, the cumulative effect from the personal desirability assigned to ambiguity/overload and boundary/insufficiency work stressors explained a substantially higher 21.19% (19.98% adj) of the variance in personal stress.

Further, when the variance explained by the factor evaluative scales is compared to the variance explained by the evaluative stressor scales, the factor driven scales are less powerful predictors of strain. They account for 5.07% (4.46% adj) less of the variance when used to predict psychological strain and 1.00% (1.01% adj) less of the variance when related to personal stress. In other words, the data indicates that the statistical reduction of correlated scales to a more common stressor scale with a higher number of items does not necessarily improve the explanation of strain. Therefore, on the basis of this result, the factor scales were eliminated from subsequent analyses.

Table E.15
Backward Regression: Factor Scales - Psychological Strain and Personal Stress on Factor Evaluative Stressor Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Psychological Strain	Boundary/Insufficiency#	12.10%	11.43%	0.3478	4.246	.0000
Mult R=.3478; SE 9.9040; F(1,131) 18.0264, p. 0000						
Personal Stress##	Ambiguity/Overload#	21.19%	19.98%	0.2720	2.805	.0058
	Boundary/Insufficiency#			0.2432	2.509	.0134
Mult R=.4604; SE 2.1562; F(2,130) 17.4824, p. 0000						

Note: pout ≥ .051 (two-tail); #Transformed Scale; Personal Stress## - Single Item Scale

"Like More" About Right" and "Like Less" Scales

Table E.16 shows that the appraisal of common work stressors in terms of "like More" "About Right" and "Like Less" each contribute useful information to the explained variance in symptoms of psychological strain. When evaluated in terms of "Like More" (i.e., desire for more of the stressor), the personal desirability of role-ambiguity and role-insufficiency stressors explains a moderate 14.76 (13.45% adj) of the variance in psychological strain. When appraised as "About Right" with a stressor (i.e., personal satisfaction with the stressor), the personal satisfaction with role-ambiguity and role-boundary stressors explains an increased 16.62% (15.34% adj) of the variance; and when appraised as "Like Less" (i.e., the desire for less of the stressor), the desire for less role-boundary and role-responsibility stressors explains a lower 14.03% (12.70% adj) of the variance in psychological symptoms of strain.

Table E.16
Backward Regression: Psychological Strain on Evaluations for "Like More" "About Right" and "Like Less" of Work Role Stressors

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
"Like More"	Role-Ambiguity#	14.76%	13.45%	0.2560	2.934	.0040
	Role-Insufficiency			0.2065	2.367	.0194
Mult R=.3842; SE 9.7903; F(2,130) 11.2539, p. 0000						
"About Right"	Role-Boundary#	16.62%	15.34%	0.2428	2.715	.0075
	Role-Ambiguity#			0.2368	2.648	.0091
Mult R=.4077; SE 9.6828; F(2,130) 12.9563, p. 0000						
"Like Less"	Role-Boundary#	14.03%	12.70%	-0.2752	-3.190	.0018
(Scales)##	Role-Responsibility#			-0.1783	-2.067	.0408
Mult R=.3741; SE 9.8323; F(2,130) 10.6038, p. 0001						

Note: pout, ≥ .051; #Transformed Variable; "Like Less" Scales## - Ambiguity, Insufficiency and Physical Environment Scales Removed From Model (See Tables E.2 & E.3).

As a result, there is support for the hypothesis (H2) that the appraisal (i.e., personal meaning assigned to stressors) of common work stressors in terms of (a) desirable, (b) undesirable and (c) congruence (i.e., balance) would each explain a significant percentage of the variance in symptoms of psychological strain.

Similarly, when related to Personal Stress, the evaluation of work stressors in terms of "Like More" "About Right" and "Like Less" each explains a moderate percentage of the variance in personal stress. As Table E.17 shows, when the stressors are appraised in terms of "Like More", the personal desirability of role-ambiguity and role-insufficiency stressors explains an increased 18.66% (17.41% adj) of the variance. When appraised as "About Right", the satisfaction with role-boundary and role-ambiguity stressors ex-plains a higher 20.83% (19.61% adj) of the variance; and when appraised as "Like Less", the desire for less role-boundary and role-overload stressors explains a lower 16.99% (15.71% adj) of the variance in symptoms of personal stress.

Table E.17
Backward Regression: Personal Stress on Evaluations for "Like More" "About Right" and "Like Less" of Work Role Stressors

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
"Like More"	Role-Ambiguity#	18.66%	17.41%	0.2782	3.263	.0014
	Role-Insufficiency			0.2427	2.847	.0051
Mult R=.4320; SE 2.1906; F(2,130) 14.9103, p. 0000						
"About Right"	Role-Boundary#	20.83%	19.61%	0.3382	3.881	.0002
	Role-Ambiguity#			0.1909	2.190	.0303
Mult R=.4563; SE 2.1612; F(2,130) 17.0991, p. 0000						
"Like Less"	Role-Boundary#	16.99%	15.71%	-0.2986	-3.452	.0008
(Scales)##	Role-Overload#			-0.1918	-2.217	.0283
Mult R=.4121; SE 2.2131; F(2,130) 13.2987, p. 0000						

Note: pout, ≥ .051; #Transformed Variable; "Like Less" Scales## - Ambiguity, Insufficiency and Physical Environment Scales Removed From Model (See Tables E.2 & E.3).

E.4.5 The Correspondence Between the Personal Desirability of Common Stressors and Dimensions of Strain

As the "Like More" "About Right" and "Like Less" evaluative scales each explain a significant percentage of the explained variance, it follows that the corresponding mean scores for psychological strain and personal stress will likely vary in sympathy with the meaning assigned to the stressor. Therefore, based on the transactional tenet that the appraisal of an imbalance with a stressor (i.e., "Like More" or "Like Less" of the stressor) may subsequently reflect in symptoms of strain, it is reasonable to hypothesise that the corresponding mean scores for strain (i.e., psychological strain & personal Stress) will be significantly higher than the corresponding "About Right" mean scores for strain. Furthermore, it also follows that increases in the magnitude of the appraised imbalance between actual and ideal demands (i.e., increases in "Like More or "Like Less" of the stressor) will likely correspond to an increase in symptoms of strain. On the other hand, for increases in the personal satisfaction (i.e., "About Right") assigned to a stressor, it is reasonable to postulate that increases in the personal satisfaction with work stressors will reflect as a reduction in symptoms of strain.

Table E.18 shows the correspondence between increases in the magnitude of the appraised imbalance (balance) with work stressors and mean scores for psychological strain and personal stress; Tables E.19 and E.20, the results from correlated samples T Tests which compared the mean scores for strain corresponding to increases in the magnitude of the scores for the "Like More" "About Right" and "Like Less" evaluative scales. In addition, Figures E.1 to E.4 illustrate the correspondence between levels in the magnitude of the appraised imbalance (balance) with stressors (i.e., intensity of the personal desirability of common work stressors) and mean scores for strain.

Table E.18

Evaluative Stressor Scales: Comparison of Strain Scale Mean Scores Corresponding to "Like More" "Like Less" and "About Right" Response Anchors

Evaluative Scale	Select If##	Cases Selected	Mean Eval Scale#	Mean Psyc Strain#	Mean Pers Stress#
Composite Evaluative Scale: Mean Score Differences					
Baseline Mean Scores: Scale Mean Scores (Excluding Zero)					
Eval Comp Scale					
Like More	GT 0	122	19.29	30.90	4.85
About Right	#	133	72.40	30.10	4.63
Like Less	GT 0	65	7.35	33.40	5.57
Equal Samples: Match "Like Less" Sample Size					
Eval Comp Scale					
Like More	GT 15	65	29.49	32.52	5.37
About Right	GT 75	65	93.88	27.26	3.74
Like Less	GT 0	65	7.35	33.40	5.57
Sample Size n ≥ 30					
Eval Comp Scale					
Like More	GT 26	30	41.10	35.57	6.10
About Right	GT 92	30	104.97	24.07	2.97
Like Less	GT 5	30	12.20	35.37	5.80
2 SD From Mean					
Eval Comp Scale					
Like More	GT 43	11	54.00	36.00	6.27
About Right	GT 108	10	113.50	19.30	2.10
Like Less	GT 14	12	18.00	32.67	5.58
Stressor Scale: Mean Score Differences					
Baseline Mean Scores: Scale Mean Scores (Excluding Zero)					
R-Boundary Scale					
Like More	GT 0	45	4.73	32.02	5.30
About Right	GT 0	128	7.34	29.77	4.56
Like Less	GT 0	35	4.31	36.03	6.14
Sample Size n ≥ 30					
R-Boundary Scale					
Like More	GT 3	40	6.35	32.50	5.48
About Right	GT 17	41	20.00	24.59	3.20
Like Less	GT 1	35	4.31	36.03	6.14
1 SD From Mean					
R-Boundary Scale					
Like More	GT 5	22	8.14	34.41	6.09
About Right	GT 17	41	20.00	24.59	3.20
Like Less	GT 3	16	6.44	34.69	5.75
2 SD From Mean					
R-Boundary Scale					
Like More	GT 8	7	10.43	41.71	7.57
About Right	GT 17	41	20.00	24.59	3.20
Like Less	GT 5	9	8.22	32.44	4.67

Note: n = 133; # All Scores > 0; #Psyc Strain - Psychological Strain; #Pers Stress - Personal Stress; #Eval Scale - Evaluative Scale; Select If## - Cases Selected Using the Scores from the Respective Evaluative Composite and Role-Boundary Scales (see Table E.3)

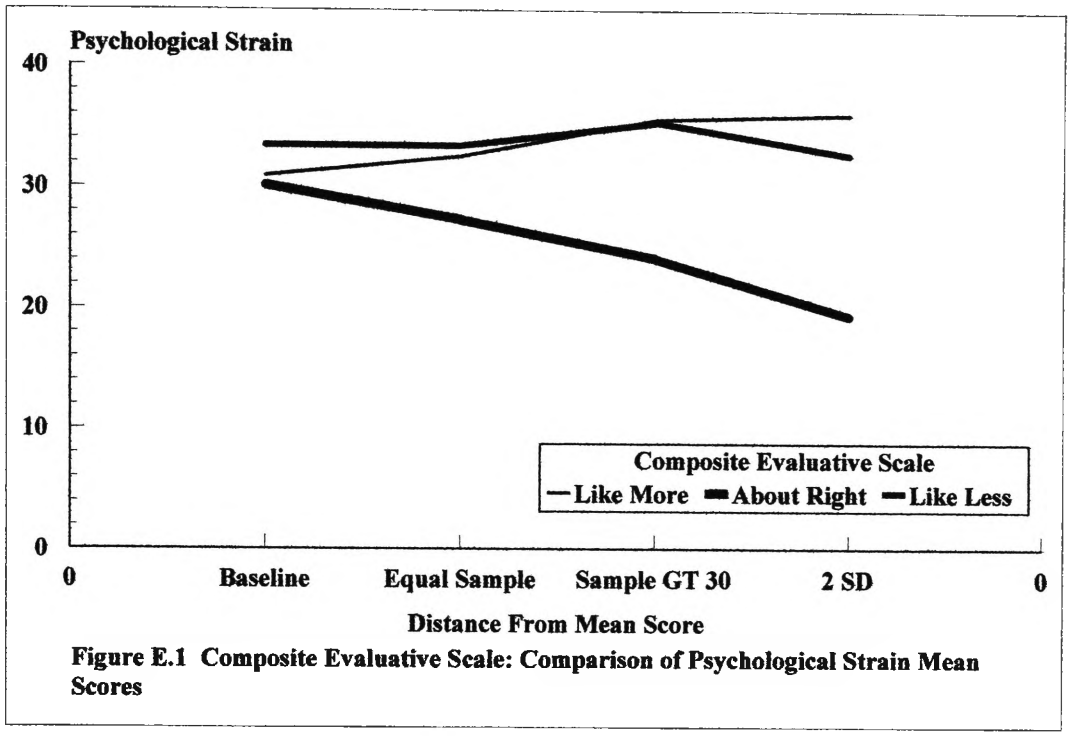


Figure E.1 Composite Evaluative Scale: Comparison of Psychological Strain Mean Scores

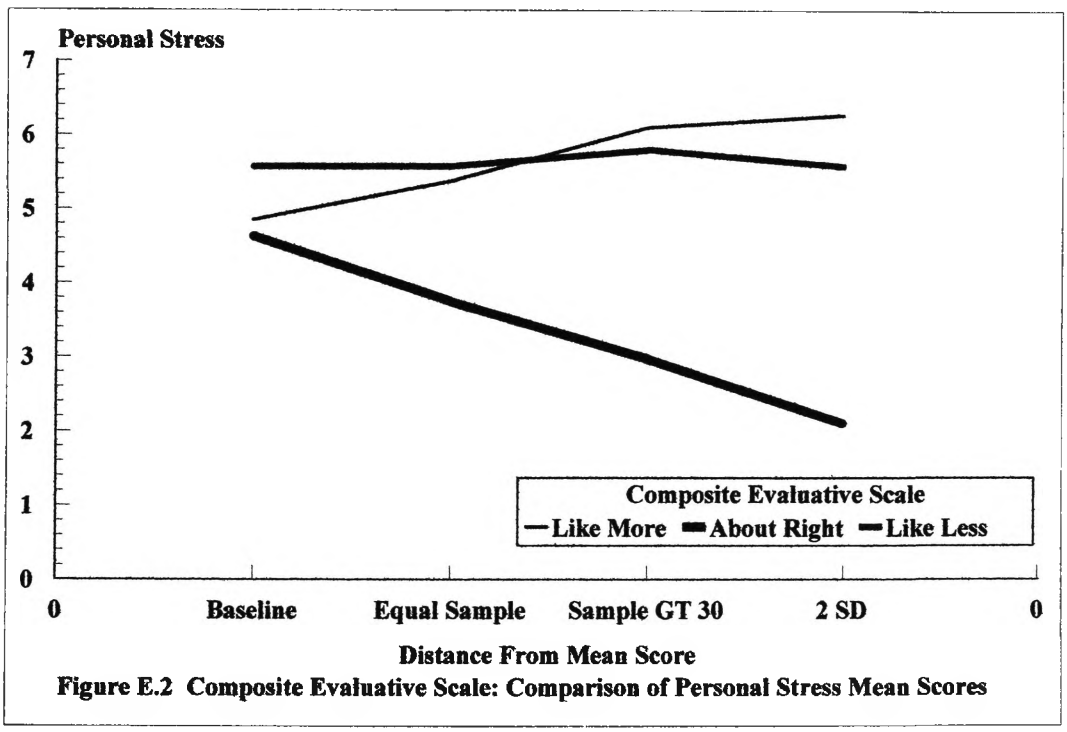


Figure E.2 Composite Evaluative Scale: Comparison of Personal Stress Mean Scores

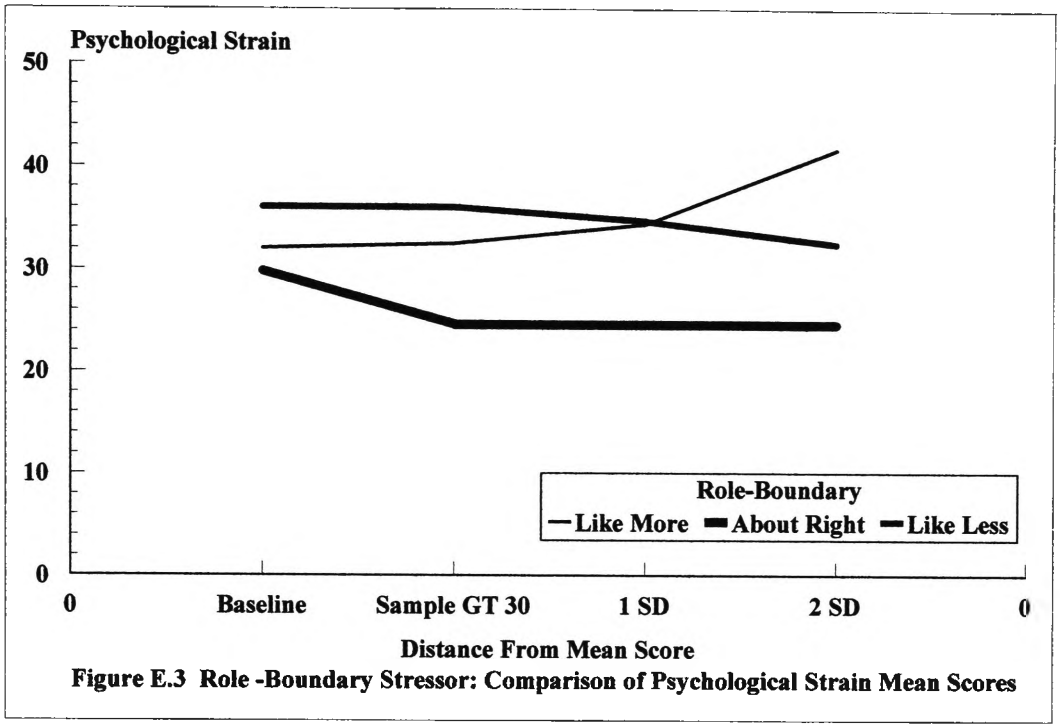


Figure E.3 Role -Boundary Stressor: Comparison of Psychological Strain Mean Scores

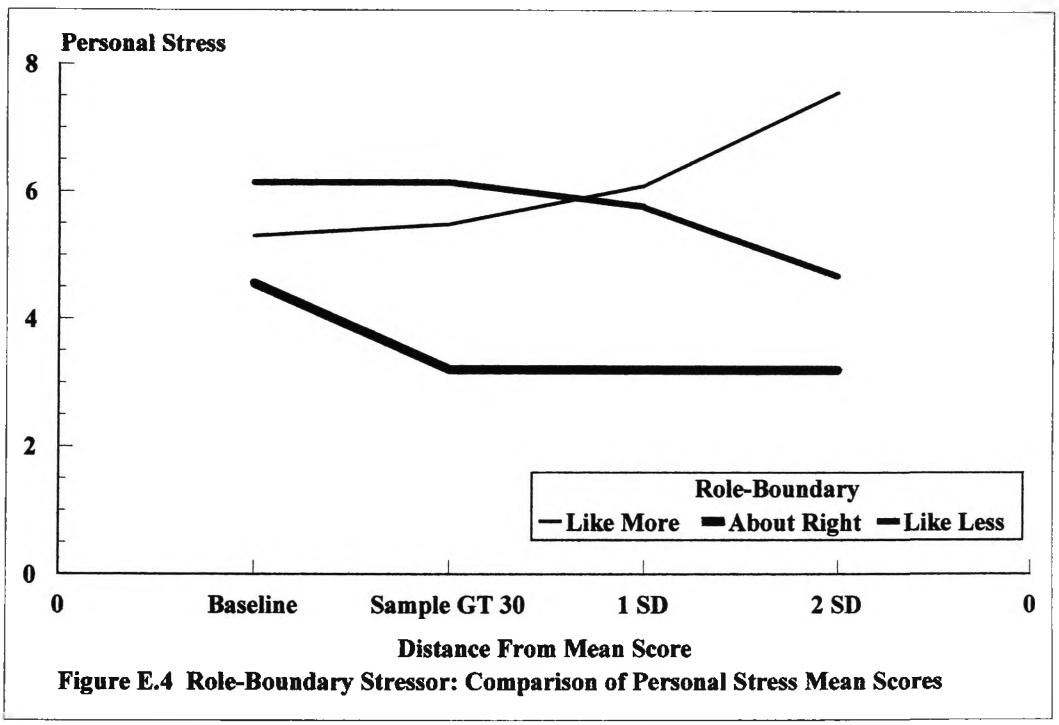


Figure E.4 Role-Boundary Stressor: Comparison of Personal Stress Mean Scores

The results in Table E.18 show that increases in the magnitude of the response to the "Like More" "About Right" and "Like Less" Composite Evaluative and Role-Boundary scales correspond to significant changes in the magnitude of psychological and personal stress symptoms of strain. Those corresponding to the "Like More" and "Like Less" scales reflecting an increase in symptoms of strain; and those for the "About Right" scale, to a decrease in strain related outcomes. For instance, the psychological strain mean scores corresponding to the "Like More" scale of the Composite Evaluative Scale increase from 30.90 for the baseline sample to a maximum 36.00 for the 2 SD sample. Conversely, those corresponding to the "About Right" scale, depict a substantial decrease from a high of 30.10 to a minimum of 19.30 for the 2 SD sample.

Furthermore, the table indicates that there are consistent differences between the mean strain scores for each of the samples. As the data indicates, increases in the magnitude of the appraised imbalance (balance) with a stressor corresponds to noticeable differences between the strain mean scores for each sample. For example, for the sample size ≥ 30, the "Like More" and "Like Less" mean scores for Psychological strain (i.e., 35.57 & 35.37) are significantly higher than the "About Right" mean score (i.e., 24.07). In other words, albeit implicit, the data indicates that the nature of the transactional relationship with a stressor (i.e., the appraised imbalance (balance) between actual and ideal) subsequently reflects in strain related outcomes.

In addition, the Figures E.1 to E.4 further illustrate the linkage between the appraisal of stressors and symptoms of strain. As the graphs show, increases in the scores for "Like More" and "Like Less" of the stressor, correspond to higher levels of psychological strain and personal stress; and increases in scores for "About Right" with the stressor, to a significant decline in symptoms of strain. Thus, based on this data, there

is both descriptive and graphical support for the hypothesis (H3) that increases in the appraisal of a work stressor as either more desirable or undesirability corresponds to higher symptoms of strain; and increases in the appraisal of a stressor as more "in balance" or congruent (i.e., satisfaction) with the values of the person, to a reduction in symptoms of strain.

Tables E.19 and E.20 show the results from correlated T Tests which tested the significance of the mean differences between the mean strain scores corresponding to the "Like More" "About Right" and "Like Less" scales.[E3] For each sample, there are significant differences between the psychological strain and personal stress mean scores corresponding to scores on the (a) "Like More" and "About Right" and (b) "Like less" and "About Right" evaluative scales.[E4] Consequently, there is support for the hypothesis (H4) that strain mean scores corresponding to either desirable or undesirable work stressors will be significantly higher than strain mean scores corresponding to appraisals of congruence with a work stressor.

[E3] There is no obvious or simple method by which to compare the mean scores for correlated samples (i.e., it is possible to have strain scores relating to each component of the evaluative scale) with missing values (personal correspondence with Assoc. Prof. David Steele, Dept. of Applied Statistics, University of Wollongong). See also Howell (1992, p. 177) for a further discussion of this issue. It is possible, however, if the samples are assumed to be independent in nature and where the sample size is ≥ 30, to use the formula $Z = \bar{y}1 - \bar{y}2 / \sqrt{\sigma^2 1/n1 + \sigma^2 2/n2}$ (Mendenhall & Ott, 1980, pp. 194-197) to compare population means using sample s^2 as a substitute for σ^2. However, due to the relatively small sample size, it was not possible to extract samples at the required n (e.g., $n \geq 30$) with independent scores for each strain scale (i.e., no matched pairs). The alternative procedure is to (a) select a data set (see Table E.20) and then delete the cases from the selected data set which do not have strain scores on either of the strain scales to be compared; (b) "plug" the missing values with either predicted mean values (i.e., dependent on the size of the data set) or the mean score for the scale; (c) take a random sample of the data set which corresponds to the required sample size; and (d) compare the mean scores using a correlated T Test at $\alpha = 0.05/c$ (see Tables E.21 & E.22).

[E4] Note: Due to multiple comparisons for each random sample (4) and thereby familywise errors, the Significance of T* for each correlated T Test is adjusted from $\alpha = 0.05$ to 0.0125 (i.e., $\alpha' = 0.05/4$).

Table E.19
Statistical Comparison of Psychological Strain Mean Scores Corresponding to "Like More" "Like Less" and "About Right" Evaluative Scores

Evaluative Scale	No Cases Retained	Missing Values	Random Sample	Scale Mean	SE of Mean Diff	T	Signif T*
Composite Evaluative Scale							
Equal Samples: Match "Like Less" Sample Size							
Like More	127	62	65	33.26	1.222	-4.92	.000
About Right	127	62	65	27.24			
Like Less	127	62	65	33.32	1.124	-5.41	.000
About Right	127	62	65	27.24			
Sample Size ≥ 30							
Like More	76	46	34	35.39	1.337	-8.28	.000
About Right	76	46	34	24.33			
Like Less	76	46	34	36.50	1.653	-7.37	.000
About Right	76	46	34	24.33			
Role-Boundary Stressor							
Sample Size ≥ 30							
Like More	103	63	40	33.25	1.261	-6.94	.000
About Right	103	62	40	24.50			
Like Less	103	68	40	36.57	1.221	-9.89	.000
About Right	103	62	40	24.50			
Sample Size 1 SD From Mean							
Like More	73	51	29	35.04	1.576	-5.81	.000
About Right	73	32	29	25.88			
Like Less	73	57	29	35.06	1.678	-5.47	.000
About Right	73	32	29	25.88			

Note: Note: For Each Block of Comparisons (i.e., Each Random Sample), Required α for Signif T* adjusted from 0.05 to 0.008 (i.e., $\alpha/c = 0.05/4 = 0.0125$).

Table E.20
Statistical Comparison of Personal Stress Mean Scores Corresponding to "Like More" "Like Less" and "About Right" Evaluative Scores

Evaluative Scale	No Cases Retained	Missing Values	Random Sample	Scale Mean	SE of Mean Diff	T	Signif T*
Composite Evaluative Scale							
Equal Samples: Match "Like Less" Sample Size							
Like More	127	62	65	5.66	0.261	-7.30	.000
About Right	127	62	65	3.75			
Like Less	127	62	65	5.63	0.246	-7.66	.000
About Right	127	62	65	3.75			
Sample Size ≥ 30							
Like More	76	46	34	6.10	0.310	-9.79	.000
About Right	76	46	34	3.04			
Like Less	76	46	34	5.84	0.384	-7.29	.000
About Right	76	46	34	5.84			
Role-Boundary Stressor							
Sample Size ≥ 30							
Like More	103	63	40	5.54	0.314	-7.32	.000
About Right	103	62	40	3.24			
Like Less	103	68	40	6.28	0.285	-10.67	.000
About Right	103	62	40	3.24			
Sample Size 1 SD From Mean							
Like More	73	51	29	6.24	0.343	-8.71	.000
About Right	73	32	29	3.24			
Like Less	73	57	29	6.01	0.344	-8.04	.000
About Right	73	32	29	3.24			

Note: Note: Note: For Each Block of Comparisons (i.e., Each Random Sample), Required α for Signif T* adjusted from 0.05 to 0.008 (i.e., $\alpha/c = 0.05/4 = 0.0125$).

E.5 Discussion

The findings of the study show that the nature of the personal desirability assigned to common work stressors (i.e., their personal evaluation or appraisal of stressors in terms of "like more" "like less" or "satisfaction" with a stressor) explains a significant percentage of the variance in symptoms of strain. Furthermore, they demonstrate that the

mediational effect of individual differences can be seen to underlie the nature and intensity of the personal desirability assigned to work stressors and the relationship with symptoms of strain. In addition, they indicate that stress may be seen as the appraisal of an imbalance between actual (i.e., recognition) and ideal (i.e., the desirability) common work stressors. Finally, the results demonstrate the applied utility of evaluative measurement to discriminate (a) the direction and intensity of appraisals of work stressors and (b) relationships with strain. The findings of the study, can be seen to reflect four main points.

First, and the most relevant to the principal aim of the study, the results show that the appraisal of work stressors in terms of personal desirability explains a significant percentage of the variance in symptoms of strain. In so doing, the study demonstrates that it is indeed possible to move beyond the more traditional P-E fit approach to the measurement of P and E elements and the prediction of strain based on (a) the relative effect of the P and E elements and (b) some form of arithmetical imbalance between the P and E elements (Caplan et al., 1975; Marshall & Cooper, 1979, 1981).

The personal desirability assigned to role-ambiguity and role-boundary demands explained a modest 15.89% (adj) of the variance in psychological strain and a higher 20.99% of the variance in a single item measure of personal Stress. As a result, there was support for the hypothesis (H1) that the appraisal of work stressors in terms of personal desirability would explain a significant percentage of the variance in symptoms of strain. Further, when this result is seen in transactional terms, there is support for the view that a "value discrepancy" approach to stress has the potential to advance the understanding of the transactional process underlying stress and strain related outcomes. However, in contrast to the results for personal desirability, the participants perception of the extent to which their respective work team has responsibility for work tasks was

not significantly related to symptoms of strain. Consequently, and although at variance with previous research (Wall et al., 1996), the results indicate that the individual's perception of team autonomy is not a significant source of stress in this work environment.

Furthermore, when the results are related to personal meaning, they indicate that the nature and significance of individual differences underlie the direction and intensity of the appraisal assigned to work stressors. If the scores related to the response options of the evaluative scale are extracted from the response data, it is possible to identify the nature and significance of individual differences underlying the appraisal of stressors. As the results for the distribution of the responses to the evaluative scale show (see Table 4.3.4): of the total responses to the scale, 21.39% were directed to the "Like More" anchor of the scale; a majority or 74% to the "About Right" anchor of the scale; and only 4.62% to the "Like Less" anchor of the scale.

Furthermore, when the distinctions in the personal meaning (i.e., individual differences) assigned to stressors are used to predict psychological strain (see Table E.16), they show that appraisals for "like more of the stressor" explain a modest 13.45% (adj) of the variance in psychological strain; those for "about right with the stressor", a higher 15.34% (adj) of the variance; and those for "like less of the stressor" a lower 12.70% (adj) of the variance in psychological strain. Therefore, on the basis of these results, people it would seem, differ in how they appraise the qualities of a stressor in terms of their desire for "more" or "less" of a stressor or alternatively, "satisfaction" with a stressor (Hulan & Blood, 1968, Payne et al., 1988). However, in spite of the modest variance explained by the respective models, each explain almost the same amount of variance. Therefore, although the results imply the influence of individual differences, it is not possible to conclude that individual differences have determined the nature of the

meaning assigned to stressors. For instance, it may be the case that social or contextual "norms" underlie the meaning assigned to work stressors (Ajzen & Fishbein, 1980; Hesketh & Gardner, 1993; Parkes, 1994).

Moreover, the results demonstrate that it is indeed possible to shift the focus of self-report measurement from an essential focus on the P and E elements of the transactional process to the gestalt (see Chapter 2.3.3, Figure 2.3.1) of the appraisal of the P and E elements (Hobfoll, 1988; Kaplan, 1983). That is, they show that an evaluative or imbalance approach to the measurement of the transactional relationship between the P and E elements in the model is (a) able to bypass the need to measure facets of both P and E and calculate indices of P-E fit; (b) a more parsimonious approach to the measurement of the imbalance between the P and E elements; and (c) avoids the problems of confounding P (i.e., ideal) and E (i.e., actual) elements. Furthermore, it provides the individual with the basis to indicate the direction and intensity of the personal meaning assigned to facets of work and the discrepancy between personal values. Accordingly, measures of appraisal based on the evaluative approach to measurement may be seen as in effect an indice of personal fit; in this case, a measure of P-E fit that reflects the personal desirability of common work stressors.[E5]

Second, the results lend support to the hypothesis that the appraisal of an imbalance between actual demands and ideal demands (i.e., value standards of the individual) are reflected as stress. As the results show, the appraisal of stressors in terms of "Like More" "Like Less" and "About Right" each explain a significant percentage of the vari-

---

[E5] Unidirectional measures of appraisal reflect the intensity but not the direction of the appraisal. As a consequence, indices of "personal fit" are only implicit in unidirectional measures of appraisal. For example, the item from the Stress Appraisal Measure (SAM) "Do I have the ability to do well in this situation" (Peacock & Wong, 1990) measures the intensity of the appraisal in terms of "yes" (5) to "no" (1). Tinkering with the item to "My ability to do well in this situation" and the use of an evaluative response scale "Like More" "About Right" "Like Less" to evaluate the neutral item, enables the person to report the intensity and direction of their appraisal of the item. As a result, the evaluative response may be seen as a measure of imbalance and thereby an indice of "personal fit".

ance in both psychological strain and personal stress. For instance, when related to the single item measure of personal stress, the appraisal of "Like More" of the stressor explained a moderate 17.41% (adj) of the variance; the appraisal of the stressor as "About Right" a higher 19.61% (adj) of the variance; and the appraisal of "Like Less" of the stressor, a slightly lower 15.71% (adj) of the variance in personal stress. As a result, there was support for the hypothesis (H2) that the appraisal of work stressors in terms of "desirable" "undesirable' and "congruence" would each explain a significant percentage of the variance in symptoms of strain.

Furthermore, although there tends to be some overlap across the models, the dimensions of appraisal each distinguish different predictors of strain. Accordingly, they indicate that people (a) are able and do discriminate the relevance of common work stressors; (b) hold personal views on the preference for different stressors; (c) appraise the nature (i.e., direction) and intensity of the relationship (i.e., personal distance) between sources of work stress and personal values; and (d) derive a sense of well-being (i.e., satisfaction/dissatisfaction) from appraisals of desirability which may subsequently reflect in symptoms of strain. As the results show, when the desirability (i.e., appraisal) of stressors is related to the prediction of psychological strain, the participants have a personal desire for more role-ambiguity (i.e., certainty or clarification of roles) and role-insufficiency (variety and satisfaction of personal needs) in their sphere of work. Alternatively, when they appraise the stressors in terms of "Like Less", they express a desire for less role-boundary (i.e., interpersonal conflict) and role-responsibility (i.e., less reliance on other colleagues and responsibility for the work of colleagues) stressors in their domains of work. When appraised in terms of "About Right", however, they expressed personal satisfaction with the nature of prevailing role-boundary (i.e., interpersonal relationships) and role ambiguity (i.e., adequate supervision and awareness of what's ex-

pected of them) work stressors. Furthermore, as indicated by the negative correlation between the evaluative composite "About Right" scale and psychological strain (i.e., -0.38**), there is in effect an inverse relationship between satisfaction and strain which subsequently reflects as a reduction in symptoms of strain (see Tables E.17 & E.18).

Third, the results show that for given levels of "desire more" of a stressor, "desire less" and "satisfaction" with a stressor (i.e, increases in the distance from the baseline mean score), the mean strain scores corresponding to the desire for more or less of the stressor are significantly higher than those corresponding to the appraisal of satisfaction (i.e., congruence) with a common work stressor. As the data shows, there is seemingly a linkage between the magnitude of imbalance (balance) states and the resultant strain related outcome. Further, if these relationships are seen in transactional terms, they demonstrate the nature of the linkage between the transactional process underlying stress and symptoms of strain (Cox, 1978).

The nature of the personal meaning assigned to a stressor has, it would seem, a direct correspondence with symptoms of strain. As the results show (see Table E.18 & Figures E.1 to E.4), for increases in the intensity of the personal desire for either more or less of a common stressor, there is generally a corresponding increase in symptoms of strain; conversely, for appraisals of "About Right" with a common stressor, increases in personal satisfaction with a stressor are related to a decrease in symptoms of strain.

Furthermore, when compared to the effect of the personal desire for "more" or "less" of a common stressor on strain, the graphs indicate that appraisals of personal satisfaction with a stressor has the more influential and linear relationship with symptoms of strain. As the graphs indicate, there is seemingly a strong inverse relationship between satisfaction and strain. Whereas for the appraisal of "Like More or "Like Less" of common stressors, with the exception of the trend for the role-boundary "Like More"

graph, the mean strain scores corresponding to "Like More" and "Like Less" appraisals tend to flatten or at times decrease for high levels of imbalance. Hence, this would seem to suggest that the relationship between dissatisfaction (i.e., desirable & undesirable) with a stressor and strain is perhaps curvilinear (Westman & Eden, 1996) in nature. Nonetheless, although there is no statistical support, there is, however, strong descriptive support for the hypothesis (H3) that the desire for more or less of a stressor corresponds to an increase in symptoms of strain and the appraisal of congruence with a stressor, to a decrease in symptoms of strain.

In addition, the results show that the magnitude of the mean strain scores corresponding to an appraised imbalance or balance with common stressors are significantly different. For given increases in the nature of the personal desirability assigned to common stressors, the corresponding mean strain scores vary in sympathy with the (a) the desire for more or less of a stressor and (b) the satisfaction with a stressor. As the results indicate, the magnitude of the mean strain scores corresponding to the appraisal of stressors as either desirable or undesirable are significantly higher than those related to the appraisal of personal satisfaction with a common stressor. Therefore, on the basis of these results, it can be concluded that the intensity of the nature of the personal desirability of common stressors has a direct linkage with increases (decreases) in symptoms of strain. Indeed, if this distinction is taken a step further, they demonstrate that people are able and do make cognitive distinctions between the desire for more or less of common stressors and the degree of personal satisfaction with common stressors. Thus, based on these results, there was support for the hypothesis (H4) that mean strain scores corre-sponding to the personal desirability of stressors in terms of more or less would be significantly higher than mean strain scores corresponding to personal satisfaction with a stressor.

Fourth, the results demonstrate the versatility of the imbalance approach to measurement and the potential utility of the Personal Desirability scale. In particular, the scale may be used as a diagnostic instruement which has the ability to (a) measure the personal context of the work environment, (b) identify significant sources of stress in the work environment; (c) identify social norms and expectations related to work and (d) discriminate individual differences in the nature of the personal meaning assigned to facets of work and (e) guide the design of work. As the results show, the scale may be used to discriminate the personal intensity of desirable and undesirable facets of work and the facets of work which relate to personal satisfaction. Furthermore, for each distinction in personal meaning, there is a significant relationship with symptoms of strain. Therefore, the scale may be seen to have both nomothetic (i.e., across contexts and populations) and situational utility as a diagnostic instruement which may be used to identify the facets of work which significantly affect individual, social or organisational functioning.

For example, when seen at the social level, the responses to the evaluative scale provide some insight to the nature and influence of contextual and social norms (i.e., beliefs and values) on the personal desirability of work stressors (Hesketh & Gardner, 1993). For example, of the responses to the Role-Insufficiency scale, 46.62% were concerned for "Like More" of the stressor, 53.38% for "About Right" with the stressor and none concerned for "Like Less" of the stressor. Therefore, it would seem that the influence of socialised expectations for insufficiency stressors such as "career progress" "work which fits the person's skills and interests" and "need for success and recognition" are able to overrule the person's "ideals" (i.e., personal values) for common role-

insufficiency stressors. Hence, there is the inference that common role-insufficiency stressors are considered socially desirable facets of work (Ajzen & Fishbein, 1980; Parkes, 1994).

However, it could also be argued that skewness in the response the to evaluative scales may be seen as a major weakness of the evaluative approach to self-report measurement, but not so. First, although the responses to the insufficiency scale are confined to one pole of the scale (i.e., in this case from "About Right" to "Like More") the variability of the responses remains the same (see Tables E.1 & E.3). Second, the evidence of social norms from the distribution of responses to the scale provides a valuable insight to the nature of the social context. Alternatively, the nature of the personal desirability assigned to a stressor, may give an insight to the nature of deficiencies in the design of work; that is, the existence of a poor P-E fit. For example, from the responses to the role-ambiguity items, 0.75% were concerned for "Like Less" of the stressor and 14.89% concerned for "like More" of the stressor. In other words, there is, it would seem, a group of library employees who desire more certainty or less ambiguity in the performance of their work, for example, the desire for clearly defined work roles and more clear directions from supervision.

In summary, the findings of the study show that an evaluative (i.e., imbalance) approach to the measurement of work stressors derives indices of "personal fit" (i.e., stress) which explain a significant percentage of the variance in symptoms of strain. Furthermore, based on the results, there is evidence of a linkage between the nature of the "personal fit" with common work stressors and the subsequent magnitude of strain related outcomes. Increases in the intensity of the appraised imbalance with a stressor relate to an increase in the magnitude of strain; increases in the satisfaction with a stressor, to a linear and inverse relationship with symptoms of strain. As such, the results

lend support to the transactional model of stress which postulates (a) that a personal imbalance with a work stressor results in a state of personal dissonance (i.e., stress) and (b) that the stress experience subsequently reflects in the arousal of a homeostatic process which seeks to eliminate or reduce psychological, physiological and behavioural symptoms of strain. Thus, when the results are seen at the individual level, they expose the significant role of individual differences underlying the appraisal of stressors and stress related outcomes (Parkes, 1994; Payne et al., 1988). That is, they illustrate that the personal meaning assigned to work stressors is the underlying factor which discriminates the direction and magnitude of the individual's well-being. In other words, a "value discrepancy" approach to the measurement of work stressors enables a personal insight to both the direction and intensity of the person's transactional relationship with common work stressors and the relationship with symptoms of strain.

One obvious limitation of the evaluative scale was the tendency for participants to use the neutral or zero point of the scale. Therefore, it could be argued that the design of the scales encourages respondents to adopt a neutral position in their response to scale items and thereby reflect as an exaggerated use of the neutral option. Thus, in future research, the neutral point should be eliminated from the evaluative scale (Dawis, 1987). In this case, the scale reverts to an eight point format and the measurement of personal satisfaction (i.e., balance) then confined to the response options (+1) and (-1).

In addition, two other limitations of the study were the exclusion of scales to measure (a) the presence of common work stressors in the work environment (i.e., the person's recognition of "actual demands") and (b) the personality dispositions (i.e., cognitive styles) of the participants. As a consequence, the study was unable to further explore the relative significance and incremental effect of personal desirability when either "in" or "placed in" the presence of common work stressors and personality dispositions re-

spectively. Thus, in future research, a differential measure of common work stressors using items parallel or commensurate with those used in the evaluative scale and a tripolar response format would enable the research to further explore the relative significance and incremental effect of the personal desirability assigned to work stressors in strain related outcomes. In addition, a measure of dispositional characteristics, for example, dispositions for hardiness (Bartone, Ursano, Wright, & Ingraham, 1989), would enable the research to further explore the role of dispositional factors in symptoms of strain.

E.6 Strain Scale Evaluations

Table E.21 presents a summary of the variance explained by models using measures of Psychological Strain and Personal Stress to capture the translation of stress to symptoms of strain; that is, they indicate how well the measure of strain is able to tap the nature of the outcome from the underlying transactional process. As the Table indicates, for each of the regression models, the single item measure of Personal Stress is the more effective (and parsimonious) measure of the strain related outcome from the underlying transactional process. On average, across the models, it accounts for 20.08% of the explained variance; in comparison, the 10 item Psychological Strain scale, accounts for a much lower 13.66% of the explained variance. Thus, if seen in proportional terms, the measure of Personal Stress on average accounts for 47% more of the variance in the model (i.e., an additional 6.42%) beyond that attributed to psychological symptoms of strain. Furthermore, when the Personal Stress scale is used with the Factor Stressor scales, it accounts for 75% more of the variance (i.e., an additional 8.55%) in the model; when used with the Evaluative composite scale, 58% more of the variance (i.e., an additional 7.6%); and when used with the evaluative stressor scales, 32% more of the variance (i.e., an additional 5.1%) in the model.

Taken overall, the more generic Personal Stress scale appears to tap domains of stress within the transactional process which are not explained or related to psychological symptoms of strain. Further, because it is a singe item scale it is impossible to examine the underlying structure of the scale. Hence, other than its value as a singe item scale (i.e., parsimony), the Personal Stress scale provides little insight to the nature of the transactional relationships underlying the domains of strain related outcomes (i.e, psychological, physiological, neurohormonal, social and behavioural). Therefore, although the results show that the Personal Stress scale has applied utility, it has in effect little theoretical and heuristic utility as a basis by which to improve the understanding of the transactional relationships which underlie the nature of strain related outcomes.

Table E.21
Strain Scale Evaluations: Psychological Strain and Personal Strain on Evaluative Work Role Stressors.

Regression Model	Dimension of Strain			
	Psychological		Personal Stress##	
	Final Solution+	Rsqr (adj)	Final Solution+	Rsqr (adj)
Evaluative Stressor Scales	Role-Ambiguity# Role-Boundary#	15.89%	Role-Boundary# Role-Ambiguity#	20.99%
Evaluative Composite Stressor Scale	Evaluative Composite#	13.17%	Evaluative Composite#	20.77%
Factor Stressor Scales	Boundary/Insufficiency#	11.43%	Ambiguity/Overload# Boundary/Insufficiency#	19.98%
"Like More"	Role-Ambiguity# Role-Insufficiency	13.45%	Role-Ambiguity# Role-Insufficiency	17.41%
"About Right"	Role-Ambiguity# Role-Boundary#	15.34%	Role-Boundary# Role-Ambiguity#	19.61%
"Like Less"	Evaluative Composite#	12.70%	Evaluative Composite#	15.71%

Note: 1) Final Solution+: (a) Prob of t Value ≤.051; (b) Shown in Order of Significance; (c) # Transformed Scale; Personal Stress## - Singe Item Scale; 2) Variables in Model: (a) Evaluative Stressor Scales - See Table E.14; (b) Factor Stressor Scale - See Table E.15; "Like More" "About Right" and "Like Less" Models - See Tables E.16 & E.17.

Appendix E.7

Work Design and Occupational Stress Questionnaire

WORK DESIGN AND OCCUPATIONAL STRESS QUESTIONNAIRE

PURPOSE

To explore occupational stress and its application to libraries in the Queensland TAFE library organisations.

CONFIDENTIALITY.

All information win be kept confidential and anonymous. NO STAFF or COLLEGE LIBRARIES WILL BE INDIVIDUALLY IDENTIFIED in this study.

FOR FURTHER INFORMATION

Please contact Dan Kearns, School of Organisational Behaviour and Human Resource Management, Faculty of Commerce and Administration, Griffith University, Nathan, 4111.

***NOTICE TO RESPONDENTS**: Please answer the questions by reporting how you **actually feel** about an issue, not how you **should feel** about an issue.*

Q1. The name of your College _____

Q2. Your age (in years) _____(please excuse this question!)

Q3. Your current library classification _____

Q4. Length of Service in Queensland TAFE libraries _____

Appendix E.7.1

Psychological Strain Scale
&
Personal Stress Scale

Psychological Strain Scale

For each question, please circle the number which you feel best describes your current feelings or mood. Use the response scale below:

+3 Most of Time	+2 Usually	+1 Often	0	-1 Sometimes	-2 Seldom	-3 Rarely or Never

		Most of Time						Rarely or Never
1	Lately, I am easily irritated	+3	+2	+1	0	-1	-2	-3
2	Lately, I have been depressed	+3	+2	+1	0	-1	-2	-3
3	Lately, I have been feeling anxious	+3	+2	+1	0	-1	-2	-3
4	I have been feeling happy lately	+3	+2	+1	0	-1	-2	-3
5	So many thoughts have been running through my head at night that I have trouble falling asleep.	+3	+2	+1	0	-1	-2	-3
6	Lately, I have been responding badly in situations that normally would not bother me	+3	+2	+1	0	-1	-2	-3
7	I find myself complaining about little thing	+3	+2	+1	0	-1	-2	-3
8	Lately, I have been worrying	+3	+2	+1	0	-1	-2	-3
9	I have a good sense of humour	+3	+2	+1	0	-1	-2	-3
10	Things are going about as they should	+3	+2	+1	0	-1	-2	-3

Personal Stress Scale

11 Overall, on a scale from 1 - 10, how stressed are you lately?
i.e., - (0) not stressed at all, to (10) completely stressed out. ☐

Appendix E.7.2

Work Team Responsibility Scale

Work Team Responsibility Scale

To what extent do you perceive that your **WORK TEAM** at the library has responsibility for performing the following tasks:

Please circle one of the alternatives which follows each question. Give one answer to each question.

1	2	3	4	5
Sole Responsibility	A good deal of responsibility	A moderate amount of responsibility	Just a little responsibility	Not at all

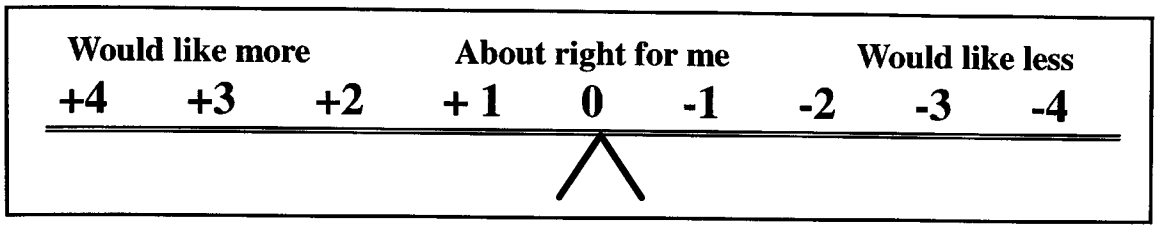
1.	Deciding who does what job each day	1	2	3	4	5
2.	Ordering books and supplies	1	2	3	4	5
3.	Disciplining team members	1	2	3	4	5
4.	Arranging cover for absence and leave	1	2	3	4	5
5.	Scheduling task rotation	1	2	3	4	5
6.	Deciding whether overtime is needed	1	2	3	4	5
7.	Planning/scheduling team development activities	1	2	3	4	5
8.	Recruiting and selecting new team members	1	2	3	4	5
9.	Organising and conducting team meetings	1	2	3	4	5
10.	Setting targets and standards of work performance	1	2	3	4	5
11.	Solving lending/service problems	1	2	3	4	5
12.	Arranging technical training (computer etc) for team members	1	2	3	4	5
13.	Monitoring safety and dealing with occupational safety issues	1	2	3	4	5
14.	Organising time for breaks	1	2	3	4	5
15.	Deciding who stays back for overtime	1	2	3	4	5

Appendix E.7.3

Job Demands Evaluation Scale

Job Demands Evaluation Scale

(After Abson, H. T., 1993)

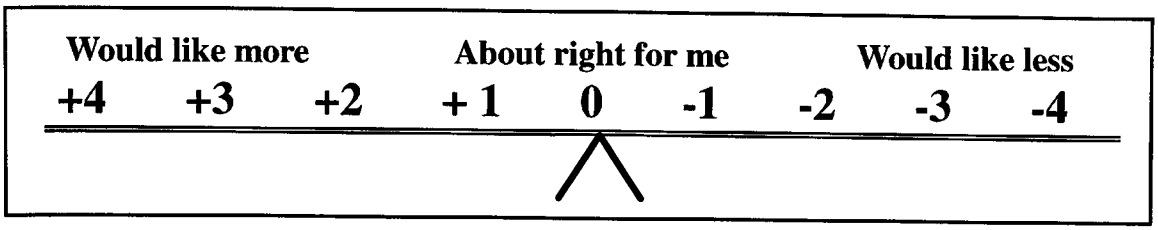


Which job features would you like more of at the library - or less of at the library?

For each statement below place a number in the box that relates to your desired balance by relating the question to the scale at the top of the page **(FROM +4 TO -4).** **For example** if you are currently **satisfied** with the issue place 0 in the box, if you would **like more** use the positive numbers to show the extent of your need, and if you would **like less**, use the minus numbers to show the extent of your need for less. (Remember to use the + and - signs).

1. INFORMATION ABOUT WHICH TASK TO START FIRST ☐
2. INFORMATION ABOUT WHERE OR HOW I SHOULD BEGIN A NEW PROJECT OR TASK ☐
3. CLEAR DIRECTIONS FROM SUPERVISORS ☐
4. INFORMATION CONCERNING PROPER PERSONAL BEHAVIOUR (E.G., INTERPERSONAL RELATIONS AT WORK) ☐
5. DEFINED TASK PRIORITIES ☐
6. SUPPORT FOR OCCUPATIONAL HEALTH AND SAFETY ☐
7. COMPUTERISATION OR AUTOMATION AT THE LIBRARY ☐
8. PERSONAL ISOLATION (E.G., TIME TO WORK ALONE ON A TASK) ☐
9. OVERTIME ☐
10. BANKTIME (AS PER AWARD) ☐
11. SHARED DECISION MAKING WITH SUPERVISORS ☐
12. "POLITICS" (DIFFERENT INTEREST GROUPS) AT WORK ☐
13. NUMBER OF SUPERVISORS ☐
14. SUPERVISORS WITH DIFFERENT APPROACHES ☐

Job Evaluation Scale Continued . . .



Q15. NUMBER OF PEOPLE I WORK FOR OR WORK WITH AT THE LIBRARY ☐

Q16. OPPORTUNITIES TO LEAD OTHERS AT WORK ☐

Q17. RESPONSIBILITY FOR THE WELFARE OF OTHERS AT WORK ☐

Q18. RESPONSIBILITY FOR OTHER PEOPLES' WORK ☐

Q19. SORTING OUT OTHER PEOPLES PROBLEMS AT WORK ☐

Q20. RELIANCE ON OTHERS TO DO THEIR WORK PROPERLY ☐

Q21. CAREER PROGRESS ☐

Q22. OPPORTUNITIES TO LEARN AND DEVELOP ☐

Q23. WORK WHICH FITS MY SKILLS AND INTERESTS ☐

Q24. SATISFACTION OF MY NEEDS FOR SUCCESS AND RECOGNITION ☐

Q25. WORK WHICH FITS MY TALENTS ☐

Q27. MANY DIFFERENT TASKS TO DO ☐

Q27. JOB RESPONSIBILITIES ☐

Q28. WORK WITH TIGHT DEADLINES ☐

Q29. HELP AT WORK ☐

Q30. THE AMOUNT OF WORK EXPECTED ☐

OTHER ? ☐

OTHER ? ☐

Thank You for completing this Questionnaire

Appendix F

Study 6

F.1 Results

F.1.1 Descriptive Statistics

Descriptive statistics (n = 162) for the scales used in the analyses are shown in Table F.1; those in Table F.2, the frequency of the responses and "goodness of fit" statistics for the "like More" "About Right" and "Like Less" response options of the evaluative scale; and Table F.3, descriptive statistics for the "like More" "About Right" and "Like Less" response options of the evaluative scale.

F.1.1.1 Scale Statistics

With the exception of the mean scores for the Role-Overload (i.e., 20.36) and Physical Environment (i.e., 16.00) scales (see Table F.1), the magnitude of mean scores for the common stressor scales are essentially similar. Furthermore, the mean scores for these scales are well below the expected value (i.e., 17.5) for a normal distribution and reflects the positive skewness of the respective distributions. Similarly, the higher mean score for the Role-Overload scale reflects the high negative skew of the scores for this variable and that for the Physical Environment scale, the more normal distribution of the scores for this scale. By contrast, the SD's for the scales approximate the expected values from the observed range of responses. In addition, the range of responses to the scales indicate a wide variability in the response to items in the respective scales. However, as indicted by the skew coefficients, the scores for the ambiguity, boundary, overload and responsibility scales are all skewed beyond the limit for a normal distribution (i.e., skew = 0.382). As a result, data transformations were used to correct the skewness of the response distributions for these scales.

Personal Desirability

Although essentially similar, the mean scores for the desirability scales are in effect approximately two units below the expected mean value (i.e., 10.00) for a normal distribution. In addition, the SD's for the scales are all below the expected value (i.e., 2.5) for the observed range of responses. Furthermore, although the range of responses to the scales reflect the range of the scale, the distribution of the scores are all significantly skewed in the positive direction. As a result, the variability of the responses (i.e., SD's) to items in the respective scales are restricted. Data transformations were used to transform response distributions with significant skewness to approximate normal distributions.

Hardiness

The mean scores for the Control (i.e., 40.82), Commitment (i.e., 42.07) and Challenge (i.e., 37.85) hardiness scales are all higher than the midpoint or mean of the scale (i.e., 35.00). Furthermore, the SD's for the scales are all below the expected values (i.e., 7.0, 9.5 & 7.5) from the observed range of responses. In addition, the range of responses for each scale cumulate toward the "Very True" pole of the scale (i.e., range from 22 - 60) and further reflects in the positive skew coefficients for each scale. As a result, the mean scores for scales are higher than expected and the scale SD's lower than the expected value.

Strain

The mean scores for the Physical, Psychological and Composite Strain scales approximate those expected from a normal distribution of the data (i.e., 70.00, 35.00 & 94.5). By contrast, with the exception of the SD for the Psychological Strain scale, the SD's for the Physical Strain and Composite Strain scales are both below the expected

values from the observed range of responses (i.e., 22.50 & 27.50). The reduced SD's, reflecting constrictions in the range of the responses to the respective scales (i.e., absence of responses to the "Very Often" pole of the scale) and the subsequent negative skewness of the response distributions for each scale.

Table F.1
Descriptive Statistics: Common Study Stressors, Personal Desirability, Dispositions for Hardiness and Dimensions of Strain

Scale	Mean	SD	Scale Range+	Observed Range	Skew	Tran/Var Skew++	Alpha
Common Stressor							
Role-Ambiguity	13.488	4.51	----	5 - 30	0.445	0.024	0.78
Role-Boundary	11.586	4.60	----	5 - 26	0.430	0.055	0.69
Role-Insufficiency	13.963	4.50	5 - 30	5 - 27	0.334	----	0.81
Role-Overload	20.364	4.15	----	5 - 24	-0.677	-0.154	0.76
Role-Responsibility	11.142	4.95	----	5 - 25	0.536	0.246	0.80
Physical Environment	16.000	4.05	----	5 - 25	-0.114	----	0.37
Composite Stressor#	86.543	16.53	30 - 180	5 - 128	0.034	----	0.84
Personal Desirability							
Role-Ambiguity	8.111	2.23	----	5 - 15	0.429	0.179	0.66
Role-Boundary	6.877	1.88	----	5 - 15	1.286	-0.257	0.60
Role-Insufficiency	8.858	2.41	5 - 15	5 - 14	0.550	0.271	0.66
Role-Overload	7.642	2.11	----	5 - 14	0.859	0.308	0.59
Role-Responsibility	6.228	1.62	----	5 - 14	1.780	-0.322	0.63
Physical Environment	8.173	2.00	----	5 - 15	0.537	0.261	0.44
Composite Pers Desir#	45.840	8.38	30 - 90	31 - 70	0.601	0.379	0.85
Hardiness							
Control	40.815	6.12	10 - 60	27 - 55	-0.115	----	0.64
Commitment	42.068	6.79	10 - 60	22 - 60	-0.162	----	0.73
Challenge	37.852	6.23	10 - 60	23 - 53	-0.100	----	0.68
Hardiness	120.745	14.70	30 - 180	81 - 168	0.069	----	0.81
Strain							
Physical	67.420	16.31	20 - 120	20 -109	-0.289	----	0.88
Psychological	34.870	10.18	10 - 60	10 - 55	-0.303	----	0.90
Composite Strain#	91.161	21.34	27 - 162	27 - 138	-0.339	----	0.91

Note: n = 162; Composite# - Formed From Items used in Sub-Scales; Tran/Var Skew++ - Variable Transformed to Reduce Skewness; Scale Range+ - Variables Removed to Improve the Reliability or Face Validity of the Scale.

Internal Consistency

Cronbach alpha coefficients for the common stressor scales indicate that the internal consistency of the scales is generally moderate. They average a moderate 0.72 across the scales and range from a minimum 0.37 for the Physical Environment scale to maximums of 0.81 for the Role-Insufficiency scale and 0.84 for the Composite Stressor scale. By contrast, the alpha coefficients for the personal desirability scales are generally lower than those for the stressor scales and average a somewhat lower 0.63 across the scales. They range from a minimum of 0.44 for the Physical Environment scale to a maximum of 0.66 for the Role-Ambiguity and Role-Insufficiency scales and 0.85 for the 30 item Composite Personal Desirability scale. Furthermore, the average alpha coefficient indicates that, on average, errors in measurement (i.e., random and non-random) account for 37.00% of the variability in the responses to the scales. In contrast, the alpha coefficient for the Physical Environment scale indicates that 56.00% of the variability in the response to items in the scale is due to errors in measurement (Spector, 1994; Spector & Brannick, 1995).

The alpha coefficients for the hardiness scales are moderate and range from a minimum of 0.64 for the internal consistency of the Control scale to a maximum of 0.81 for the 30 item Hardiness scale. Furthermore, the coefficient for the Hardiness scale compares with the 0.82 obtained by Bartone et al. (1989) from a sample of n = 178.

The alpha coefficients for the strain scales indicate that the items in each scale have high internal consistency. They range from a minimum of 0.88 for the Physical Strain scale to a maximum of 0.91 for the 27 item Composite Strain scale. Furthermore, the

alpha coefficient for the Composite Strain scale reflects the deletion of the items "Falling/Staying Asleep" "Tense/Anxious" and "Depression" from the scale due to their semantic overlap or similarity with items from the Psychological Strain scale.

F.1.1.2 Evaluative Scale: Response Distributions

Table F.2 shows the frequency of the responses to the "Like More" (i.e., response values "3" "2") "About Right" (i.e., response values "1" "-1") and "Like Less" (i.e., response values "-2" "-3") response anchors of the Evaluative Stressor scale. The majority of responses to the evaluative stressor scales fall in the "About Right" response anchor of the respective scales. As the Table F.2 indicates, 61.57% of the total responses (i.e., 4890) fall within this region of the scale; in contrast, 23.48% fall within the "Like More" anchor of the scale; and a disproportionate 14.95% in the "Like Less" anchor of the scale. Furthermore, when the response distribution is compared to that expected from a normal distribution, there is a shortfall of approximately 6.5% in the number of responses for "About Right" and an excess of approximately 7.5% in the number of response for the "Like More" anchor of the scale. That is, for a normal distribution, 68% of the responses would be expected to fall in the "About Right" anchor of the scale and 16% in both the "Like More" and "Like Less" anchor of the scale.

Furthermore, when the data is related to the respective evaluative stressor scales, the percentage of responses for the "About Right" anchor range from a low 43.19% (i.e., Role-Insufficiency) to a maximum of 79.39% for the Role-Responsibility scale. In contrast, responses to the "Like More" anchor of the scale range from a low 7.36% (role-responsibility) to a maximum of 56.07% for the Role-Insufficiency scale; and those for the "like Less" anchor of the scale, from a minimum of 0.74% for the Role-Insufficiency scale to a maximum of 29.57% for the Role-Overload scale. Thus, on the

basis of this distribution, the response distribution for the "Like Less" anchor of the Role-Insufficiency scale (i.e., 0.74%) does not attract sufficient responses to form a normal distribution of the responses. Furthermore, in contrast to the expected U distribution, it indicates that the response to the scale is essentially linear in nature.

Furthermore, as shown in the table, Chi-Square (X^2) goodness of fit statistics for each scale indicate that the distribution of responses to each scale is not by chance. That is, they indicate that some underlying factor in common with the scale has determined the individual's response to the items in the respective scales.

Table F.2
Evaluative Stressor Response Scales: Response Distribution Comparisons

Scale Response	Like More#		About Right#		Like Less#		Goodness of Fit
Variables	**n**	**%**	**n**	**%**	**n**	**%**	**χ^2**
Role-Ambiguity	273	33.50	492	60.37	50	6.13	359.58, p = .000
Role-Boundary	99	12.15	564	69.20	152	18.65	477.03, p = .000
Role-Insufficiency	457	56.07	352	43.19	6	0.74	409.99, p = .000
Role-Overload	88	10.80	486	59.63	241	29.57	296.73, p = .000
Role-Responsibility	60	7.36	647	79.39	108	13.25	782.08, p = .000
Physical Environment	171	21.00	470	57.67	174	21.35	217.21, p = .000
Total Responses	1148	23.48	3011	61.57	731	14.95	1808.40, p = .000
Average Responses	191.33	23.48	501.83	61.58	121.83	14.95	----

Note: n = 163; Response Scale Options: Like More# +3 +2; About Right# +1 -1; Like Less# -2 -3;
Total Responses RA RB RI RO RS PH Scales = 815; Total Responses for Scales = 4890.

F.1.1.3 Evaluative Scale: Response Anchor Descriptive Statistics

Table F.3, shows the descriptive data related to the response anchors of the Evaluative Stressor scales. Further, to equalise the scale range for each scale, the response values corresponding to each response option were recoded to the following values: the "Like More" scale to the values 3 2 0 0 0 0; the "About Right" scale to the values 0 0 3 3 0 0; and the "Like Less" scale, to the values 0 0 0 0 2 3.

Descriptive Statistics

Mean scores for the "Like More" scales are much less than those expected from the observed range of responses (i.e., 7.5) and reflect constrictions in the range of responses and the positive skewness of the data distributions. In particular, those for the boundary (i.e., 1.302), overload (i.e., 1.222) and responsibility (i.e., 0.784) scales are substantially below the midpoint for the scale and reflect the significant positive skewness of the responses to these scales. That is, the responses are skewed toward the zero or "satisfied" pole of the response scale. By contrast, those for the "About Right" tend to be slightly higher than the expected mean and reflect the wide variability in the range of responses and the skewness of the respective scales. Mean scores for the "Like Less" scales, however, are substantially less than the expected value. The value for each scale reflecting the effect of constrictions in range of responses and the significant positive skewness in the response distributions for the respective scales. For example, the range of the responses for the insufficiency scale fall within the range 0 - 3 and further reflects in the high positive skew coefficient (i.e., 5.845) for this scale. Thus, on the basis of these results, the distributions for the "Like More" and "Like Less" scales tend to be tied or gather toward to the "satisfied" pole (i.e., "About Right") of each scale.

With the exception of the SD's for the Role-Ambiguity and Role-Insufficiency "Like Less" scales, the SD's for the scales largely reflect the expected values for a normal distribution. Furthermore, in general, they indicate a reasonable variability in the range of responses to the respective scales. For instance, the expected values for the composite evaluative scales "Like More" (i.e., 10.00), "About Right" (i.e., 18.75) and "Like Less" (i.e., 9.5) correspond to SD's of 9.009, 15.478 and 7.826 respectively.

Table F.3
Descriptive Statistics: "Like More" "About Right" and "Like Less" Personal Desirability Response scales

Scale	Mean	SD	Scale Range	Observed Range	Skew	Tran/Var Skew##	Alpha
			"Like More" Response Scale				
Personal Desirability							
Role-Ambiguity	4.827	3.431	----	0 - 13	0.208	----	0.68
Role-Boundary	1.302	1.738	----	0 - 9	1.567	-0.232	0.33
Role-Insufficiency	6.611	3.757	0 - 15	0 - 15	0.216	----	0.62
Role-Overload	1.222	1.453	----	0 - 7	1.007	0.305	0.07
Role-Responsibility	0.784	1.629	----	0 - 9	2.814	1.471	0.53
Physical Environment	3.222	2.055	----	0 -10	0.175	----	0.11
Composite Pers Desir#	17.069	9.009	0 - 90	0 - 40	0.275	----	0.75
			"About Right" Response Scale				
Personal Desirability							
Role-Ambiguity	7.907	4.445	----	0 - 15	0.091	----	0.64
Role-Boundary	10.407	3.930	----	0 - 15	-0.586	-0.006	0.48
Role-Insufficiency	6.519	4.290	0 - 15	0 - 15	0.156	----	0.52
Role-Overload	9.000	4.081	----	0 - 15	-0.255	----	0.51
Role-Responsibility	11.944	3.685	----	0 - 15	-1.267	0.349	0.58
Physical Environment	7.796	3.804	----	0 - 15	-0.003	----	0.32
Composite Pers Desir#	53.574	15.478	0 - 90	12 - 87	-0.048	----	0.78
			"Like Less" Response Scale				
Personal Desirability							
Role-Ambiguity	0.648	1.582	----	0 - 11	3.379	-1.585	0.53
Role-Boundary	2.105	2.514	----	0 - 12	1.434	0.280	0.48
Role-Insufficiency	0.074	0.425	0 - 15	0 - 3	5.845	-5.507	-0.23+
Role-Overload	3.420	2.988	----	0 - 12	0.811	0.200	0.56
Role-Responsibility	1.469	2.557	----	0 - 15	2.231	-0.671	0.67
Physical Environment	2.352	2.337	----	0 - 9	0.845	0.298	0.38
Composite Pers Desir#	9.938	7.826	0 - 90	0 - 38	1.205	0.026	0.79+

Note: n = 162; #Composite Scale Formed From Items Used in Sub-Scales; Tran/Var Skew## - Variable Transformed to Reduce Skewness; Response Scale 3 2 1 -1 -2 -3 Recoded: a) "Like More" - 3 2 0 0 0 0; b) "About Right" 0 0 3 3 0 0 ; c) "Like Less" 0 0 0 0 2 3; Alpha+ - Items Removed From Cronbach Alpha Calculation Due Zero Variance: RI - 3 Items, Pers Desir Comp - 3 Items.

With the exception of the skewed distributions for the "Like More" Responsibility scale and the "Like Less" Ambiguity, Insufficiency and Responsibility scales, data transformations were able to transform scales with skewed distributions to approximate

normality. However due to extreme skewness and low number of responses (see Table F.2) for the "Like Less" Role-Ambiguity and Role-Insufficiency scales, they were dropped from subsequent analyses.

The Cronbach alpha coefficients for the scales indicate that the internal consistency of the items in the scales range from extremely low to moderate. Those for the "Like More" scales range from a low 0.11 for the Physical Environment scale to a maximum of 0.75 for the composite scale; those for the "About Right" scale, from a low 0.32 for the Physical Environment scale to a maximum of 0.78 for the composite scale; and those for the "Like Less" scale, from a low -0.23 for the Role-Insufficiency scale to a maximum of 0.79 for the composite scale.

F.1.2 Regression Analyses

Tables F.4 and F.5 present a summary of the results from baseline regression models which explored the effect of (a) common study stressors; (b) the personal desirability assigned to common study stressors and (c) dispositions for hardiness on symptoms of physical and psychological strain. Tables F.6 and F.7, a summary of the results from a series of regression analyses which explore the relative effect of personal desirability in terms of "Like More" "About Right" and "Like Less" on physical and psychological strain. For each regression model, an alpha pout at $\geq .051$ (Two Tailed) is used to (a) effect the removal of a variable from the regression model.

F.1.2.1 Baseline Analyses

From the results for the baseline models (see Tables F.4 & F.5), the recognition of common study stressors, the personal desirability assigned to common study stressors and dispositions for hardiness each account for a significant percentage of the variance in physical and psychological symptoms of strain. For example, the cumulative effect

of role-ambiguity, role-overload and role-boundary common study stressors explain 18.64% (17.10% adj) of the variance in physical strain; and a similar 18.10% (17.07% adj) of the variance in psychological strain. Conversely, the effect of the personal desirability assigned to role-insufficiency and role-ambiguity stressors, explains a reduced 11.25% (10.13% adj) of the variance in physical strain; and 12.10% (11.00%) of the variance in psychological strain. By contrast, the cumulative effect of dispositions for hardiness in terms of control and commitment explain a substantially higher 26.88% (25.96% adj) of the variance in physical strain; and dispositions for challenge, commitment and control, an increased 32.32% (31.03% adj) of the variance in psychological strain.

Table F.4
Backward Regression: Baseline Models - Physical Strain on Common Study Stressors, Personal Desirability and Dispositions for Hardiness

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Common Study Stressors	Role-Ambiguity#			0.2084	2.767	.0063
	Role-Boundary#	18.64%	17.10%	0.1969	2.479	.0142
	Role-Overload#			-0.1855	-2.330	.0210
Mult R=.4318; SE 14.8533; F(3,158) ,12.0681; p .0000						
Personal Desirability	Role-Ambiguity#	11.25%	10.13%	0.2060	2.478	.0143
	Role-Insufficiency#			0.1894	2.278	.0241
Mult R=.3354; SE 15.4646; F(2,159) 10.0767, p .0001						
Hardiness	Control	26.88%	25.96%	-0.3328	-3.487	.0006
	Commitment			-0.2273	-2.381	.0184
Mult R=.5185; SE 140367; F(2,159) 29.2292, p .0000						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale.

Table F.5
Backward Regression: Baseline Models - Psychological Strain on Common Study Stressor, Personal Desirability and Dispositions for Hardiness

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Common Study Stressors	Role-Overload#	18.10%	17.07%	-0.2729	-3.484	.0060
	Role-Boundary#			0.2350	3.000	.0
Mult R=.4254; SE 9.2742; F(2,159) ,17.5705; p .0000						
Personal Desirability	Role-Insufficiency#	12.10%	11.00%	0.2179	2.634	.0093
	Role-Ambiguity#			0.1920	2.320	.0216
Mult R=.3479; SE 20.1330; F(2,159) 10.9457; p .0000						
Hardiness	Challenge	32.32%	31.03%	-0.3040	-4.507	.0000
	Commitment			-0.2523	-2.735	.0069
	Control			-0.1958	-2.105	.0369
Mult R=.5685; SE 8.4575; F(3,158) 25.1493, p .0000						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale

Further, when the variance explained by the respective models is seen in relative terms, the cumulative effect of common study stressors explains an extra 7.39% (6.97% adj) of the variance in physical strain and 6.00% (6.07% adj) beyond that explained by the personal desirability of stressors; and the cumulative effect of dispositions for hardiness, an additional 8.24% (8.86% adj) of the variance in physical strain and 14.22% (13.96% adj) beyond that explained by common study stressors. In other words, when compared to the variance explained by the recognition of common study stressors and the personal desirability of stressors, hardiness cognitive styles explain substantially more of the variability in physical and psychological symptoms of strain.

F.1.2.2 "Like More" "About Right" and "Like Less" Response Anchor Analyses

These analyses sought to unpack the nature and effect of the personal desirability assigned to common study stressors. As Tables F.6 and F.7 show, the appraisal of common study stressors in terms of "Like More" (i.e., desirable) "About Right" (i.e., congruence or satisfaction) and "Like Less" (i.e., undesirable) each explain a significant percentage of the variance in physical and psychological strain.

As the results for the physical strain model indicate (see Table F.6), when common study stressors are appraised in terms of "Like More" of the stressor (i.e., the person's desire for more of the stressor), the personal desire for more role-insufficiency and role-ambiguity stressors explains a moderate 14.76 (13.69% adj) of the variance in physical strain. Similarly, when the personal desirability of stressors is appraised as "About Right" (i.e., personal satisfaction with the stressor) for the person, the personal satisfaction with role-insufficiency and role-ambiguity stressors explains a slightly higher 15.72% (14.66% adj) of the variance in physical strain. By contrast, when common

Table F.6
Backward Regression: Physical Strain on Personal Desirability for "Like More" "About Right" and "Like Less" of Common Study Stressors

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
"Like More"	Role-Insufficiency	14.76%	13.69%	0.2436	3.146	.0020
	Role-Ambiguity			0.2281	2.945	.0037
Mult R=.3842; SE 15.1556; F(2,159) 13.7669, p .0000						
"About Right"	Role-Insufficiency	15.72%	14.66%	-0.2791	-3.711	.0003
	Role-Ambiguity			-0.2205	-2.932	.0039
Mult R=.3965; SE 15.0700; F(2,159) 14.8291, p .0000						
"Like Less"##	Role-Boundary#	03.86%	03.26%	0.1959	2.536	.0122
Mult R=.1966; SE 16.0449; F(1,160) 6.4293, p .0122						

Note: pout, ≥ 0.051; # Transformed Variable; "Like Less" ## - Due Significant Skewness, the Ambiguity and Insufficiency Scales Were Removed From Model (See Tables F.2 & F.3).

study stressors are appraised in terms of "Like Less" of the stressor (i.e., their desire for less of the stressor), the personal desire for less role-boundary stressors explains a substantially lower but significant 3.86% (3.26% adj) of the variance in symptoms of physical strain.

Similarly, the results for the psychological strain model demonstrate that the personal desirability of common study stressors in terms of "Like More" "About Right" and "Like Less" each explain a significant percentage of the variance in symptoms of psychological strain. As Table F.7 shows, when stressors are appraised as "Like More" of the stressor, the personal desire for more role-insufficiency and role-ambiguity stressors explains a moderate 12.45% (11.35% adj) of the variance in psychological strain. Further, when appraised as "About Right" for the person, the satisfaction with role-insufficiency and role-ambiguity stressors explains a slightly lower 11.76% (10.65% adj) of the variance in

Table F.7
Backward Regression: Psychological Strain on Personal Desirability for "Like More" "About right" and "Like Less" of Common Study Stressors

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
"Like More"	Role-Insufficiency	12.45%	11.35%	0.2488	3.170	.0018
	Role-Ambiguity			0.1819	2.318	.0217
Mult R=.3528; SE 9.5888; F(2,159) 11.3049, p. 0000						
"About Right"	Role-Insufficiency	11.76%	10.65%	-0.2706	-3.517	.0006
	Role-Ambiguity			-0.1537	-1.998	.0474
Mult R=.3430; SE 9.6264; F(2,159) 10.5969, p. 0000						
"Like Less"##	Physical Environment#	03.79%	03.19%	0.1947	2.511	0.0130
Mult R=.1947; SE 10.0204; F(1,160) 6.3054, p. 0130						

Note: pout, ≥ 0.051; # Transformed Variable; "Like Less" Scales## - Ambiguity and Insufficiency Scales Removed From Model (See Tables F.2 & F.3).

strain. However, when common study stressors are appraised as "Like Less" of the stressor, the personal desire for less physical environment stressors accounts for a substantially lower 3.79% (3.19% adj) of the variability in symptoms of psychological strain.

F.1.3 The Correspondence Between the Personal Desirability of Stressors and Dimensions of Strain

Since the "Like More" "About Right" and "Like Less" appraisals of personal desirability each explain a significant percentage of the variance in strain, it is likely that the corresponding mean strain scores for physical and psychological strain will vary in sympathy with the meaning assigned to the stressor (see results study five). Therefore, based on the transactional tenet that the appraisal of an imbalance with a stressor (i.e., "Like More" or "Like Less" of the stressor) may subsequently reflect in symptoms of strain, it is reasonable to hypothesise that the corresponding mean scores for strain will be significantly higher than the corresponding "About Right" mean scores for strain. Furthermore, it is likely that increases in the magnitude of the appraised imbalance between actual and ideal demands (i.e., increases in "Like More or "Like Less" of the stressor) will correspond to an increase in symptoms of strain. On the other hand, for increases in the personal satisfaction (i.e., "About Right") assigned to a stressor, it is reasonable to postulate that increases in the personal satisfaction with work stressors will reflect as a reduction in symptoms of strain.

Figures F.1 to F.4 illustrate the correspondence between increases in the magnitude of scores for (a) the Composite Personal Desirability scale and (b) Role-Boundary Personal Desirability scale and mean scores for physical and psychological strain. In addition, Tables F.8 and F.9 show the results from correlated samples T Tests which compared the mean scores for both physical and psychological strain corresponding to

increases in the magnitude of the scores for (a) the "Like More" "About Right" and "Like Less" Composite Personal Desirability and (b) Role-Boundary Personal Desirability scales.[F1]

Figures F.1 to F.4 further illustrate the linkage between the appraisal of common study stressors and symptoms of strain. As the graphs show, in general, increases in the magnitude of scores for "Like More" and "Like Less" of common study stressors correspond to higher levels of physical and psychological strain. Conversely, increases in the scores for "About Right" with common study stressors (i.e., increases in personal satisfaction), correspond to a noticeable decline in symptoms of strain.

In addition, from the comparison data for the Personal Desirability Composite scale, Tables F.8 and F.9 indicate that significant differences exist between the mean strain scores for physical and psychological strain corresponding to scores for (a) the "Like More" and "About Right" Personal Desirability scales; and (b) the "Like less" and "About Right" Personal Desirability scales.[F2]

However, from the comparison data for the personal desirability of Role-Boundary stressors, Tables F.8 and F.9 indicate that only three of the eight comparisons between mean strain scores for physical and psychological strain corresponding to scores for the "Like More" "About Right" and "Like Less" Role-Boundary scales are significant. As the tables show, seven of the comparisons were in effect significant at $\alpha \leq 0.05$; however, following correction for multiple comparisons, only three remain significant.

[F1] Note: Although not a significant predictor of strain, the Role-Boundary Personal Desirability scale was chosen as the basis for the comparisons of mean strain scores as it had the more normal distribution of responses to the "Like More" "Like Less" and "About Right" response anchors of the scale (see Table F.2).

[F2] Note: Due to multiple comparisons (6) and thereby familywise errors, the Significance of T* for each T Test is adjusted from $\alpha = 0.05$ to 0.008 (i.e., $\alpha' = 0.05/6$).

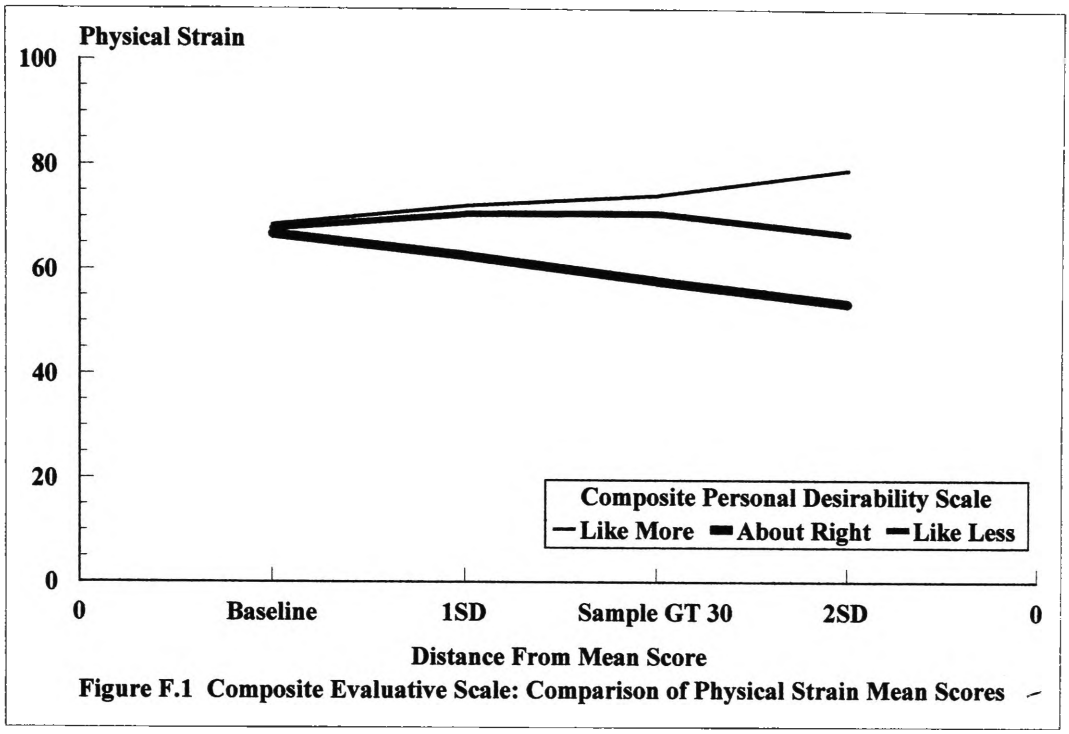


Figure F.1 Composite Evaluative Scale: Comparison of Physical Strain Mean Scores

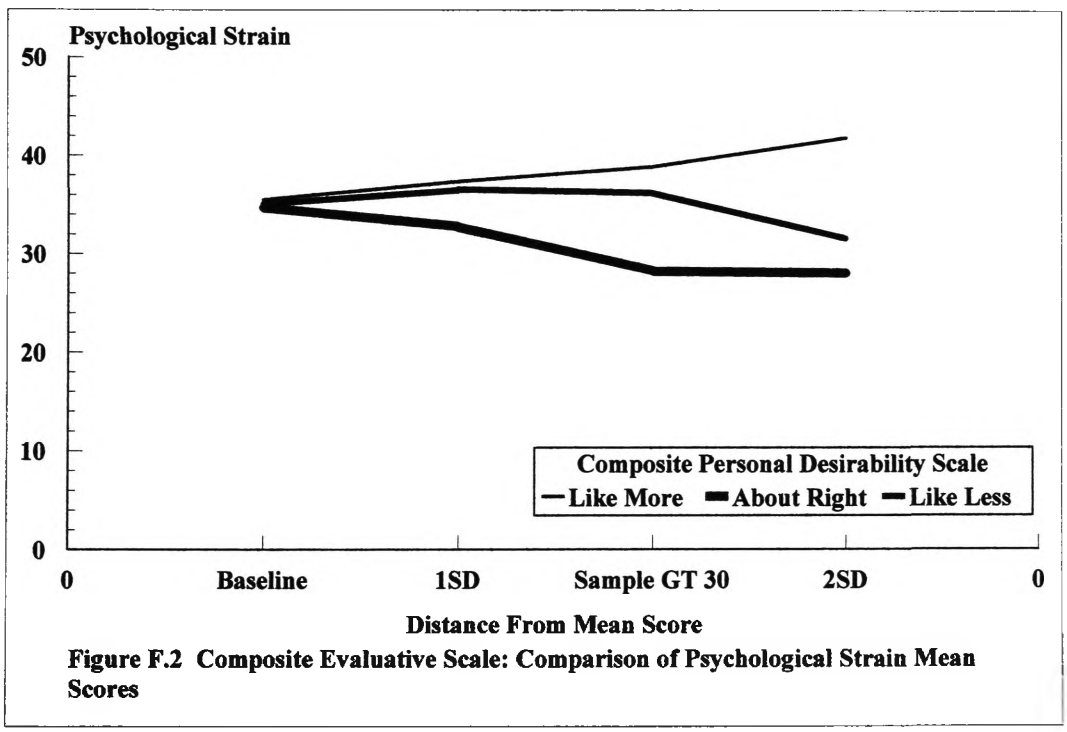


Figure F.2 Composite Evaluative Scale: Comparison of Psychological Strain Mean Scores

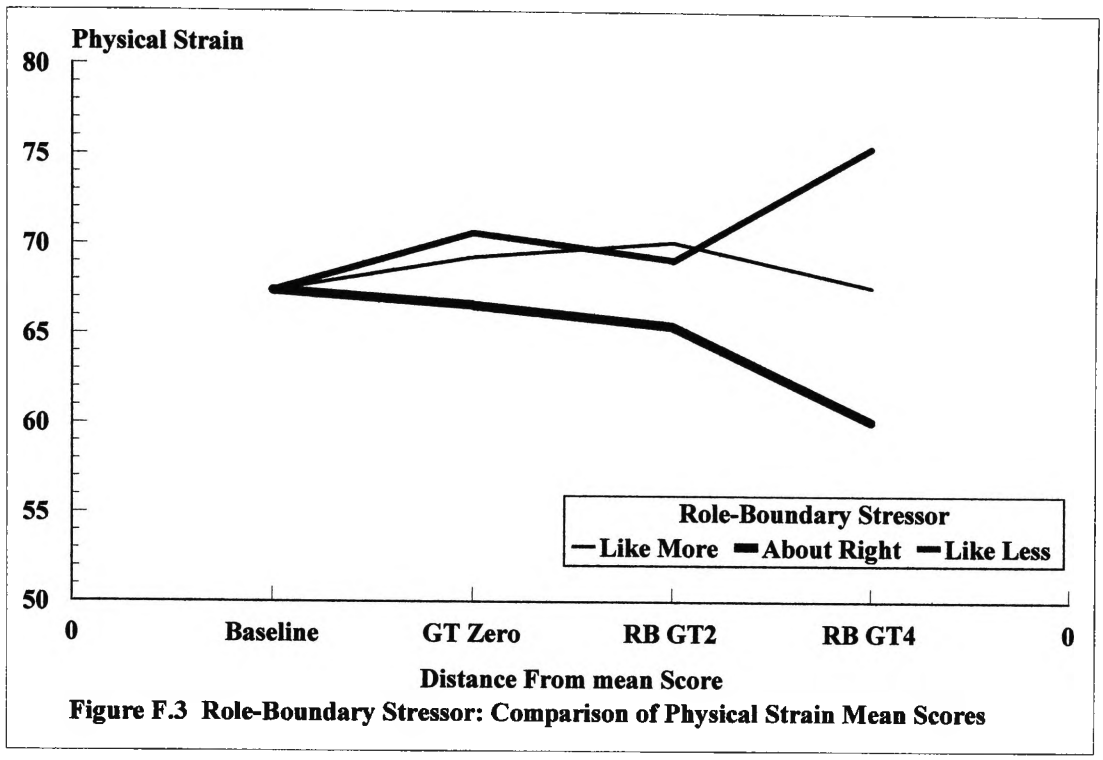


Figure F.3 Role-Boundary Stressor: Comparison of Physical Strain Mean Scores

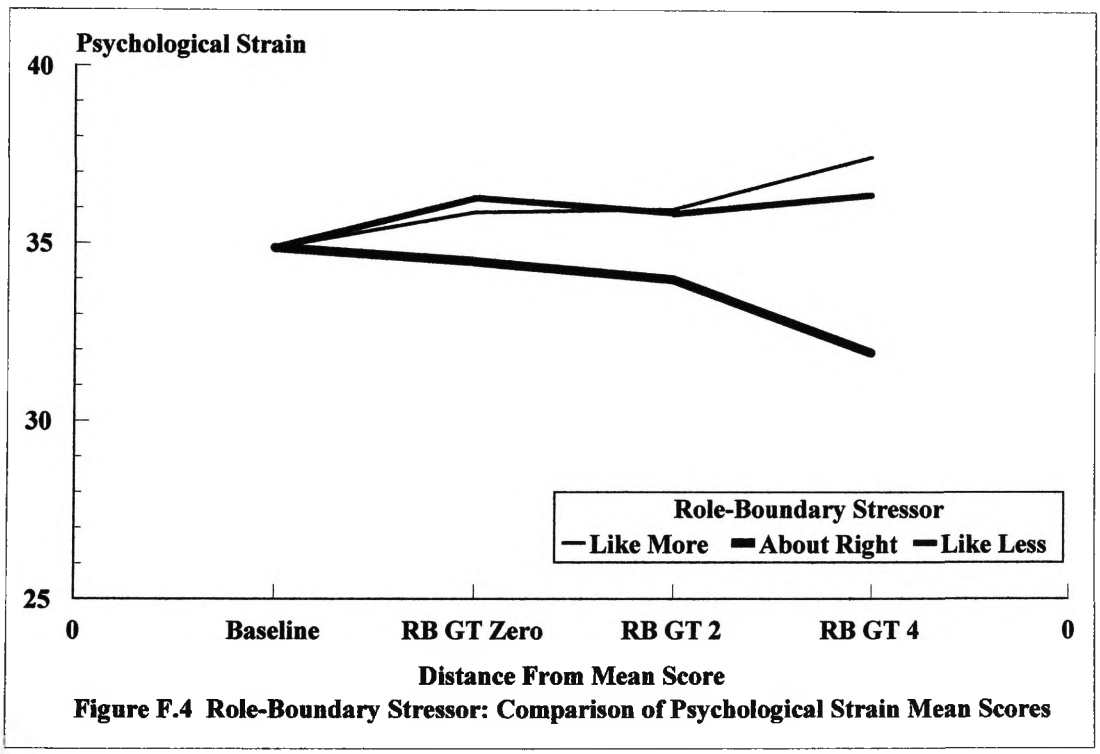


Figure F.4 Role-Boundary Stressor: Comparison of Psychological Strain Mean Scores

For Role-Boundary scores greater than zero (i.e., n = 77), significant differences exist between both the physical and psychological strain mean scores corresponding to scores for the "Like Less" and "About Right" scales; while for desirability scores greater than two (i.e., n = 36), the difference between mean scores for physical strain corresponding to scores for the "Like More" and "About Right" scales is significant.

Table F.8
Statistical Comparison of Physical Strain Mean Scores Corresponding to "Like More" "Like Less" and "About Right" Evaluative Scores

Evaluative Scale	No Cases Retained	Missing Values	Random Sample	Scale Mean	SE of Mean Diff	T	Signif T*
Personal Desirability Composite Scale							
Sample Size ≈ 1SD From Scale Mean							
Like More	162	87	76	72.3408	1.540	-5.86	.000
About Right	162	88	76	63.3144	----	----	----
Like Less	162	85	76	70.9189	1.430	-5.32	.000
About Right	162	88	76	63.3144	----	----	----
Sample Size ≥ 30							
Like More	85	54	31	73.7659	2.577	-6.75	.000
About Right	85	52	31	56.3823	----	----	----
Like Less	85	52	31	70.6933	2.511	-5.70	.000
About Right	85	52	31	56.3823	----	----	----
Role-Boundary Common Study Stressor							
Role-Boundary Score GT Zero							
Like More	162	88	77	70.1801	1.879	-2.36	.021
About Right	162	38	77	65.7427	----	----	----
Like Less	162	70	77	72.3635	1.655	-4.00	.000
About Right	162	38	77	65.7427	----	----	----
Role-Boundary Score GT 2							
Like More	151	125	36	73.1642	3.148	-2.84	.008
About Right	151	63	36	64.2381	----	----	----
Like Less	151	104	36	71.6703	2.915	-2.55	.015
About Right	151	63	36	64.2381	----	----	----

Note: For Each Block of Comparisons (i.e., Each Random Sample), Required α for Signif T* Adjusted From 0.05 to 0.008 (i.e., $\alpha/c = .05/6 = 0.008$)

Table F.9
Statistical Comparison of Psychological Strain Mean Scores Corresponding to "Like More" "Like Less" and "About Right" Evaluative Scores

Evaluative Scale	No Cases Retained	Missing Values	Random Sample	Scale Mean	SE of Mean Diff	T	Signif T*
Personal Desirability Composite Scale							
Sample Size ≈ 1SD From Scale Mean							
Like More	162	87	76	37.1976	0.926	-4.73	.000
About Right	162	88	76	32.8203	----		
Like Less	162	85	76	36.3270	0.929	-3.77	.000
About Right	162	88	76	32.8203	----	----	----
Sample Size ≥ 30							
Like More	86	54	31	38.9895	1.423	-8.25	.000
About Right	86	52	31	27.2479	----	----	----
Like Less	86	52	31	37.2762	1.542	-6.50	.000
About Right	86	52	31	27.2479	----	----	----
Role-Boundary Stressor							
Role-Boundary Score GT Zero							
Like More	162	88	77	35.8465	1.026	-1.83	.071
About Right	162	38	77	33.9686	----	----	----
Like Less	162	70	77	36.7601	0.993	-2.81	.006
About Right	162	38	77	33.9686	----	----	----
Role-Boundary Score GT 2							
Like More	151	125	36	36.9912	1.887	-1.99	.054
About Right	151	63	36	33.2344	----	----	----
Like Less	151	104	36	38.0595	1.819	-2.65	.012
About Right	151	63	36	33.2344	----	----	----

Note: For Each Block of Comparisons (i.e., Each Random Sample), Required α for Signif T* Adjusted From 0.05 to 0.008 (i.e., $\alpha/c = 0.05/6 = 0.008$).

Thus, from the trend of the graphical data shown in Figures F1 to F4, there is descriptive support for the hypothesis (H3) that increases in the appraisal of a common study stressor as either more desirable or more undesirable corresponds to an increase in symptoms of strain; and increases in the appraisal of congruence (i.e., satisfaction) with common study stressors, to a decrease in symptoms of strain. Furthermore, on the evidence of the graphical data and significant T Tests, there is support for the

hypothesis (H4) that strain mean scores corresponding to either desirable or undesirable common study stressors will be significantly higher than strain mean scores corresponding to congruence or personal satisfaction with common study stressors.

F.3.0 Strain Scale Evaluations

Table F.10 presents a summary of the variance explained by models using measures of physical, psychological and composite strain to capture or account for the nature of the personal relationship between stressors and strain; that is, they indicate how well the measure of strain is able to account for the nature of the outcome from the underlying transactional process. As Table F.10 indicates, for each of the regression models, the 30 item Composite Strain scale is generally the more effective (but not the most parsimonious) measure of the strain related outcome from the underlying transactional process. On average, across the models, it accounts for 19.46% (adj) of the variance in symptoms of strain; in comparison, the 10 item Psychological Strain scale, accounts for a lower 17.28% of the explained variance; and the 20 item Physical Strain scale, on average a slightly lower 16.87% (adj) of the explained variance. Thus, in proportional terms, the measure of composite strain on average accounts for 12.6% more of the explained variance (i.e., an additional 2.18%) than that attributed to psychological symptoms of strain and 15.4% (i.e., an additional 2.59%) more than that attributed to physical strain.

However, when seen in terms of parsimony, the Psychological Strain scale is the more efficient and specific measure of strain. On average, each variable in the scale accounts for 1.728% of the variance explained by the model; those in Physical Strain scale, a substantially lower 0.48% of the variance; and those in Composite Strain scale, an increased 0.72% of the variance. Alternatively, when seen in terms of general utility, the multidimensional Composite Strain scale has the greater utility and

versatility. On average, it accounts for the highest percentage of strain; and furthermore, is designed to tap facets of both physical and psychological strain. In addition, these facets of strain may be extracted from the scale if there is a need to further explore the transactional relationship between stressors and more specific types of strain. Therefore, this scale may be seen as the preferred approach for the measurement of symptoms in strain.

Table F.10
Strain Scale Evaluations: Dimensions of Strain on Common Study Stressors, Desirability of Study Stressors and Dimensions of Hardiness.

Regression Model	Dimension of Strain					
	Physical		Psychological		Composite Strain	
	Final Solution+	Rsqr (Adj)	Final Solution+	Rsqr (Adj)	Final Solution+	Rsqr (adj)
Common Study Stressor	Role-Ambiguity# Role-Boundary# Role-Overload#	17.10%	Role-Overload# Role-Boundary#	17.07%	Role-Boundary# Role-Ambiguity# Role-Overload#	21.94%
Personal Desirability	Role-Ambiguity# Role-Insufficiency#	10.13%	Role-Insufficiency# Role-Ambiguity#	11.00%	Role-Insufficiency#	6.43%
Hardiness	Control Commitment	25.96%	Challenge Commitment Control	31.03%	Commitment Control Challenge	32.79%
Model of "Best Fit"	Hard Control Des R-Insuffic# Role-Boundary Hard Challenge	33.29%	Hard Control Hard Challenge Role-Boundary Des R-Insuffic#	36.70%	Hard Control Des R-Insuffic# Hard Challenge Role-Boundary	40.52%
"Like More"	Role-Insufficiency Role-Ambiguity	13.69%	Role-Insufficiency Role-Ambiguity	11.35%	Role-Insufficiency Role-Ambiguity	15.43%
"About Right"	Role-Insufficiency Role-Ambiguity	14.66%	Role-Insufficiency Role-Ambiguity	10.65%	Role-Insufficiency Role-Ambiguity	15.82%
"Like Less"	Role-Boundary#	03.26%	Physical Environ#	03.19%	Physical Environ#	03.35%

Note: 1) Final Solution+: (a) Prob of t Value ≤.051; (b) Shown in Order of Significance; (c) # Transformed Scale; 2) Variables in Model: (a) Common Study Stressor, Personal Desirability and Hardiness Scales - See Table F.1; (b) "Like More" "About Right" and "Like Less" Scales - See Table F.3.

Appendix F.3

Stress at University Survey

University of Wollongong

Department of Psychology

Stress at University Survey

Researcher: Tom Abson, PhD Student.

Welcome to the stress at university survey. My name is Tom Abson and I'm a PhD student in the Department of Psychology. I would like your help to gather information concerning the nature of stress associated with your studies at this university.

The objective of my research is to identify the areas of your studies which you feel are stressful and the relationship of these stressful areas with your current feeling of well-being.

If you would like to participate in this research, please indicate in the space below. The questionnaires should take no longer than 30 minutes to complete. There is no need to provide your name or any form of identification on the questionnaire. Any information you provide in the questionnaires is strictly confidential and will be destroyed at the conclusion of my research.

Should you have any further questions concerning the questionnaire please contact me in the Dept. of Psychology (Room 1016; Phone 213156), or at my home phone (02) 5243322.

NOTE:

1. You are under no obligation to complete the questionnaire and therefore free to withdraw from the study at any time.
2. Any complaints regarding the conduct of this research should be directed to the secretary of the University of Wollongong Human Experimentation Ethics Committee - Phone: 213079.

Would Like To Participate ☐ (please tick)

Thanking you for your contribution to this research

Tom Abson

Dealing With Stress at University
A useful contact service is the
student counselling service in the
student centre.
Phone: 213445 or 213446

Appendix F.3.1

Study Demands Scale

Study Demands Scale

This questionnaire asks you to describe various features of your study and your relationships with students and the teaching staff at this university. We want to know how often you experience the following aspects of study at this university. For each question, please circle the positive or negative number which best describes your feelings about the question. Evaluate each item using the response scale:

Most of Time	Often	Now and Then		Rarely	Mostly Never
+3	+2	+1	-1	-2	-3

		Most of Time		Now and Then		Mostly Never	
Q.1	I am expected to do too many different assignments in too little time	+3	+2	+1	-1	-2	-3
Q.2	I feel that my responsibilities at university are increasing	+3	+2	+1	-1	-2	-3
Q.3	I have to study under tight time deadlines	+3	+2	+1	-1	-2	-3
Q.4	I wish I had more help to deal with the study demands placed upon me at University	+3	+2	+1	-1	-2	-3
Q.5	I feel that I am expected to do more study than is reasonable	+3	+2	+1	-1	-2	-3
Q.6	I feel that my coursework is progressing about as well as I hoped it would	+3	+2	+1	-1	-2	-3
Q.7	I feel that my coursework fits my skills and interests	+3	+2	+1	-1	-2	-3
Q.8	My coursework uses my talents	+3	+2	+1	-1	-2	-3
Q.9	I feel my university course will provide me with a good future	+3	+2	+1	-1	-2	-3
Q.10	I am able to satisfy my needs for success and recognition from my studies	+3	+2	+1	-1	-2	-3
Q.11	When faced with several assignments, I know which one should be done first	+3	+2	+1	-1	-2	-3
Q.12	I know where to begin a new assignment when it is given to me	+3	+2	+1	-1	-2	-3
Q.13	The priorities of my coursework are clear to me	+3	+2	+1	-1	-2	-3

		Most of Time			Now and Then		Mostly Never
Q.14	I have a clear understanding of how my lecturers and tutors expect me to spend my time	+3	+2	+1	-1	-2	-3
Q.15	I understand what is acceptable personal behaviour at university - ie, socially correct behaviour such as manners etc.	+3	+2	+1	-1	-2	-3
Q.16	I feel conflict between what my lecturers/tutors expect me to do and what I feel is right and proper	+3	+2	+1	-1	-2	-3
Q.17	I feel caught between student factions (eg, political groups) at university	+3	+2	+1	-1	-2	-3
Q.18	I have more than one person telling me how I should study	+3	+2	+1	-1	-2	-3
Q.19	My lecturers/tutors have conflicting ideas about what I should be doing	+3	+2	+1	-1	-2	-3
Q.20	I have divided loyalties (ie, between groups and/or friends) at university	+3	+2	+1	-1	-2	-3
Q.21	I spend time concerned with the problems other students at university bring to me	+3	+2	+1	-1	-2	-3
Q.22	I am responsible for the welfare of other students (eg, friends, student groups) at university	+3	+2	+1	-1	-2	-3
Q.23	People at university look to me for leadership	+3	+2	+1	-1	-2	-3
Q.24	I have responsibility for the activities of other students	+3	+2	+1	-1	-2	-3
Q.25	I worry about whether the students in my study/ tutorial group will get things done properly	+3	+2	+1	-1	-2	-3
Q.26	I have adequate breaks between lectures and tutorials	+3	+2	+1	-1	-2	-3
Q.27	Resources at university (eg, library, computers) are adequate for my studies	+3	+2	+1	-1	-2	-3
Q.28	I have an erratic lecture and tutorial schedule	+3	+2	+1	-1	-2	-3
Q.29	Due to my lecture/tutorial schedule, I am exposed to personal isolation	+3	+2	+1	-1	-2	-3
Q.30	I have a regular study schedule	+3	+2	+1	-1	-2	-3

Appendix F.3.2

Psychological Strain Scale

Psychological Strain Scale

In this next section we need to know something about your feelings and mood at the present time - ie, over the past week or so. For each question, please circle the positive or negative number which you feel best describes your current feelings or mood. Consider each question using the response scale:

Most of Time	Often	Now and Then		Rarely	Mostly Never
+3	+2	+1	-1	-2	-3

		Most of Time		Now and Then		Mostly Never	
Q.1	Lately, I am easily irritated	+3	+2	+1	-1	-2	-3
Q.2	Lately, I have been depressed	+3	+2	+1	-1	-2	-3
Q.3	Lately, I have been feeling anxious	+3	+2	+1	-1	-2	-3
Q.4	I have been happy lately	+3	+2	+1	-1	-2	-3
Q.5	So many thoughts run through my head at night that I have trouble falling asleep.	+3	+2	+1	-1	-2	-3
Q.6	Lately, I respond badly in situations that normally wouldn't bother me	+3	+2	+1	-1	-2	-3
Q.7	I find myself complaining about little things	+3	+2	+1	-1	-2	-3
Q.8	Lately, I have been worrying	+3	+2	+1	-1	-2	-3
Q.9	I have a good sense of humour	+3	+2	+1	-1	-2	-3
Q.10	Things are going about as they should	+3	+2	+1	-1	-2	-3

Appendix F.3.3

Biographical Data

Personal Details

We need To Know Something About You:

Your Age _____ years

Sex _____ Male or Female

Student _____ Full Time

_____ Part Time

Work _____ Full Time

_____ Part Time

_____ Not Working

Average for
your Coursework _____ % (approx)

Appendix F.3.4

Life Disposition Scale

Life Disposition Scale

Listed below are a number of statements about life which people often feel differently about. Think carefully about each question and how much you feel the statement is true of you. Circle your positive or negative response on the scale opposite the question. Consider each question using the response scale:

Very True		Now and Then		Not True	
+3	+2	+1	-1	-2	-3

		Very True		Now and Then		Not True	
Q.1	Most of my life gets spent doing things that are worthwhile	+3	+2	+1	-1	-2	-3
Q.2	Planning ahead can help avoid most future problems	+3	+2	+1	-1	-2	-3
Q.3	No matter how hard I try, my efforts usually accomplish nothing	+3	+2	+1	-1	-2	-3
Q.4	I don't like to make changes in my everyday schedule	+3	+2	+1	-1	-2	-3
Q.5	The "tried and True" ways are always best	+3	+2	+1	-1	-2	-3
Q.6	Working hard doesn't matter, since only the lecturers/tutors profit by it	+3	+2	+1	-1	-2	-3
Q.7	By working hard you can always achieve your goals	+3	+2	+1	-1	-2	-3
Q.8	Most of what happens in life is just meant to be	+3	+2	+1	-1	-2	-3
Q.9	When I make plans I'm certain I can make them work	+3	+2	+1	-1	-2	-3
Q.10	It's exciting to learn something about myself	+3	+2	+1	-1	-2	-3
Q.11	I really look forward to my work	+3	+2	+1	-1	-2	-3
Q.12	If I'm working on a difficult task, I know when to seek help	+3	+2	+1	-1	-2	-3

		Very True		Now and Then		Not True	
Q.13	I won't answer a question until I'm sure I understand it	+3	+2	+1	-1	-2	-3
Q.14	I like a lot of variety in my coursework	+3	+2	+1	-1	-2	-3
Q.15	Most of the time, people listen carefully to what I say	+3	+2	+1	-1	-2	-3
Q.16	Thinking of yourself as a free person just leads to frustration	+3	+2	+1	-1	-2	-3
Q.17	Trying your best at university really pays off in the end	+3	+2	+1	-1	-2	-3
Q.18	My mistakes are usually very difficult to correct	+3	+2	+1	-1	-2	-3
Q.19	It bothers me when my daily routine gets interrupted	+3	+2	+1	-1	-2	-3
Q.20	Most good athletes and leaders are born, not made	+3	+2	+1	-1	-2	-3
Q.21	I often wake up eager to take up my life wherever it left off	+3	+2	+1	-1	-2	-3
Q.22	Lots of times, I really don't know my own mind	+3	+2	+1	-1	-2	-3
Q.23	I respect rules because they guide me	+3	+2	+1	-1	-2	-3
Q.24	I like it when things are uncertain or unpredictable	+3	+2	+1	-1	-2	-3
Q.25	I can't do much to prevent it, if someone wants to harm me	+3	+2	+1	-1	-2	-3
Q.26	Changes in routine are interesting to me	+3	+2	+1	-1	-2	-3
Q.27	Most days, life is really interesting and exciting for me	+3	+2	+1	-1	-2	-3
Q.28	What happens to me tomorrow depends on what I do today	+3	+2	+1	-1	-2	-3
Q.29	It's hard to imagine anyone getting excited about studying	+3	+2	+1	-1	-2	-3
Q.30	Ordinary work is just too boring to be worth doing	+3	+2	+1	-1	-2	-3

Appendix F.3.5

Personal Health Scale

Personal Health Scale

(After Osipow, S. H., & Spokane, A. R., 1983; Smith, P., & Bennett, S., 1983)

We also need to know something about your general health. Listed below are a number of common health problems. Please circle the positive or negative number which you feel best indicates how frequently you suffer from each health problem. Record your response to each question using the response scale:

Very Often	Often	Now and Then		Seldom	Rarely or Never
+3	+2	+1	-1	-2	-3

		Very Often		Now and then		Rarely Never	
Q.1	Stomach upsets	+3	+2	+1	-1	-2	-3
Q.2	Unplanned weightgain	+3	+2	+1	-1	-2	-3
Q.3	Eyestrain	+3	+2	+1	-1	-2	-3
Q.4	Headaches	+3	+2	+1	-1	-2	-3
Q.5	Tense/anxious	+3	+2	+1	-1	-2	-3
Q.6	Coughing	+3	+2	+1	-1	-2	-3
Q.7	Erratic eating	+3	+2	+1	-1	-2	-3
Q.8	Tiredness	+3	+2	+1	-1	-2	-3
Q.9	Eat Wrong Foods	+3	+2	+1	-1	-2	-3
Q.10	Uninterested	+3	+2	+1	-1	-2	-3
Q.11	Colds	+3	+2	+1	-1	-2	-3
Q.12	Excess Drinking	+3	+2	+1	-1	-2	-3
Q.13	Aches/Pains	+3	+2	+1	-1	-2	-3
Q.14	Depression	+3	+2	+1	-1	-2	-3
Q.15	Appetite (Hungry)	+3	+2	+1	-1	-2	-3
Q.16	Indigestion	+3	+2	+1	-1	-2	-3
Q.17	Flu	+3	+2	+1	-1	-2	-3
Q.18	Loss of Appetite	+3	+2	+1	-1	-2	-3
Q.19	Lethargic (Drowsy)	+3	+2	+1	-1	-2	-3
Q.20	Falling/staying asleep	+3	+2	+1	-1	-2	-3

Appendix F.3.6

Study Demands Evaluation Scale

Study Demands Evaluation Scale

In this questionnaire we want you to evaluate aspects of your study at university. That is, we want you to consider each question and decide if you would like to have more or less of the study feature in your studies at this university. For each question, please circle the positive or negative number which represents the amount you would "like more" or "like less" of the study feature. Evaluate each question using the response scale:

Would like more		About right for me		Would like less	
+3	+2	+1	-1	-2	-3

		Would Like More		About Right		Would Like less	
Q.1	Assignments to do	+3	+2	+1	-1	-2	-3
Q.2	Coursework that uses my talents	+3	+2	+1	-1	-2	-3
Q.3	Tight time deadlines	+3	+2	+1	-1	-2	-3
Q.4	Help to deal with study demands	+3	+2	+1	-1	-2	-3
Q.5	The amount of study I'm expected to do	+3	+2	+1	-1	-2	-3
Q.6	Responsibility for my coursework	+3	+2	+1	-1	-2	-3
Q.7	Coursework that fits my skills and interests	+3	+2	+1	-1	-2	-3
Q.8	Progress in my coursework	+3	+2	+1	-1	-2	-3
Q.9	Regular study schedule	+3	+2	+1	-1	-2	-3
Q.10	Satisfaction of my needs for success and recognition	+3	+2	+1	-1	-2	-3
Q.11	Guidance concerning which assignment to start first	+3	+2	+1	-1	-2	-3
Q.12	Responsibility for other students	+3	+2	+1	-1	-2	-3
Q.13	Information concerning acceptable personal behaviour (ie, socially correct behaviour) at university	+3	+2	+1	-1	-2	-3
Q.14	Resources at university - eg, library, computers etc.	+3	+2	+1	-1	-2	-3
Q.15	Information concerning the priorities of my coursework	+3	+2	+1	-1	-2	-3
Q.16	Leadership at university	+3	+2	+1	-1	-2	-3

		Would Like More		About Right		Would Like less	
Q.17	Student factions (eg, political groups) at university	+3	+2	+1	-1	-2	-3
Q.18	Shared decision making with my lecturers and tutors	+3	+2	+1	-1	-2	-3
Q.19	Lecturers/tutors with conflicting ideas about my studies	+3	+2	+1	-1	-2	-3
Q.20	Divided loyalties (ie, between groups and/or friends) at university	+3	+2	+1	-1	-2	-3
Q.21	Concern for the problems of other students at university	+3	+2	+1	-1	-2	-3
Q.22	Clear directions from lecturers and tutors	+3	+2	+1	-1	-2	-3
Q.23	Responsibility for the welfare of other students	+3	+2	+1	-1	-2	-3
Q.24	The number of people telling me how I should study	+3	+2	+1	-1	-2	-3
Q.25	Breaks between lectures and tutorials	+3	+2	+1	-1	-2	-3
Q.26	Information about where/how to begin a new assignment	+3	+2	+1	-1	-2	-3
Q.27	Reliance on other students to do their work properly	+3	+2	+1	-1	-2	-3
Q.28	Erratic lecture and tutorial schedules	+3	+2	+1	-1	-2	-3
Q.29	Personal isolation (ie, time alone while at university)	+3	+2	+1	-1	-2	-3
Q.30	Future career prospects from my course	+3	+2	+1	-1	-2	-3

End of Questionnaire

Thanking you for your participation in this research

Tom Abson

Note: Please return completed questionnaire to my mailbox adjacent to the Psychology Department office or directly to my office (room 1016)

Appendix G

Study 7

G.1 Results

G.1.1 Descriptive Statistics

Descriptive statistics (n = 205) for the scales used in the study are shown in Appendix G.1.1.1, Table G.1 and Appendix G.1.1.2, G.3; comparative statistics for the OSI stressor scales in Appendix G.1.1.1, Table G.2; the frequency of responses and "goodness of fit" statistics for the "like More" "About Right" and "Like Less" response anchors of the Personal Desirability scale in Appendix G.1.1.2, Table G.4; and descriptive statistics for the "like More" "About Right" and "Like Less" response anchors of the Personal Desirability scale in Appendix G.1.1.2, Table G.5.

G.1.1.1 OSI Common Stressor, Coping, Dispositional and Strain Scales

Descriptive data for the OSI common stressor, coping strategies, hardiness and strain scales is shown in Table G.1. In addition, comparisons with normative and sample data are shown in Table G.2

OSI Stressor

With the exception of the mean score for the "Relationships with people" scale (i.e., 21.859), the mean scores for the OSI scales approximate those expected from the midpoint of the respective response scales. Furthermore, the SD's for the scales are all below the expected values for the observed range of responses. In each case, constrictions in the observed range of responses would seem to underlie the restricted variability of the responses to each scale. That is, for each scale, the maximum observed score is below the maximum possible value. In particular, the "Relationships with people" maximum score (i.e., 45) is 15 units below the maximum scale value (i.e., 60) and subsequently reflects as a narrow SD for the scale. Furthermore, with the exception of the

high alpha coefficient for the OSI Composite scale (i.e., 0.9406), the Cronbach alpha coefficients for the respective scales are moderate and range from 0.6939 for the "Intrinsic to job" scale to 0.8135 for the "Structure and climate" scale.

Furthermore, with the exception of the "Home/Work" scale, the response distributions for the respective scales are all negatively skewed and indicates that the participants do not, in general, view common stressors as "Very definitely a source of stress". Where necessary, data transformations were used to transform skewed distributions to approximate normal distributions.

Coping Scales

The mean score for the Physical Coping scale (i.e., 26.88) is below the expected mean value (i.e., 31.50) for the range of the scale and reflects the significant positive skewness (i.e., skew = 0.399) of the responses to the scale. In contrast, the mean scores for the Rational/Cognitive (i.e., 26.42), Social Support (i.e., 41.06) and Composite Coping (i.e., 122.16) scales are all higher than the expected mean for the range of the scale. In particular, the mean score for the Social Support coping scale is 14.06 units higher that the expected mean value (i.e., 27.00) for the scale and results from the high negative skewness (i.e., skew = -1.737) of the responses to the items in this scale. Similarly, the SD's for the coping scales are all below the expected values for the observed range of responses and would seem to reflect constrictions in the range of observed responses. For instance, the range of responses for the composite scale are compressed within the range 60 - 185 and reflects in the SD for the scale which is 10.44 below the expected value (i.e., 31.25). Data transformations were used to transform the response distribu-

tions for the Physical and Social Support scales to normal distributions. Alpha coefficients for the coping scales are moderate and range from 0.6458 for the Rational/Cognitive scale to a maximum of 0.8874 for the Social Support coping scale.

Hardiness

The mean scores for the hardiness scales are all higher than the expected mean value for the range of scale and reflect the negative skewness of the responses to the scale items. In contrast, the SD's for scales are all below the expected value for the observed range of responses. In particular, the SD for the Hardiness scale (i.e., 18.68) is 10.32 below the expected value (i.e., 29.00). In each case, the reduction in the magnitude of the SD's reflects a constriction in the range of responses at the low end of each scale. As a result, the minimum score for each scale is much higher than the theoretical minimum value (i.e., 10 & 27). In other words, the data indicates that the participants have in general tended to avoid the low hardiness pole (i.e., "very false") of the respective response scales. For instance, the responses to the Hardiness scale are significantly skewed toward the high hardiness pole (i.e., "very true") of the scale and indicates that the participants employ cognitive styles which are generally above average in hardiness. That is, the mean for hardiness of 149.23 is substantially higher than expected mean of 121.50 from the range of the scale.

The internal consistency of the hardiness scales range form mediocre to moderate. The alpha coefficients range from 0.5774 for the Control scale to a maximum of 0.8198 for the Hardiness scale. The coefficient for the Hardiness scale, however, reflects the removal of the control item "Most of what happens in life is just meant to be"; and the challenge items "I won't answer a question until I'm sure I understand it" and "I respect

rules because they guide me" from the scale due to negative item-total correlations. Furthermore, they are comparable with those reported by Bartone et al. (1989) for short form Hardiness scale (i.e., 0.82) and the long form control (i.e., 0.66), Commitment (i.e., 0.82) and Challenge (i.e., 0.62) hardiness sub-scales.

Table G.1
Descriptive Statistics: OSI Stressor, Coping, Hardiness and Strain Scales

Scale	Mean	SD	Scale Range+	Observed Range	Skew	Tran/Var Skew++	Alpha
OSI Stressor							
1. Intrinsic to Job	33.854	6.154	9 - 54	16 - 52	-0.216	----	.6939
2. Managerial Role	35.717	7.220	11 - 66	11 - 56	-0.385	-0.216	.7319
3. Relationships	21.859	6.433	10 - 60	12 - 45	-0.069	----	.6949
4. Career	31.868	7.353	9 - 54	9 - 49	-0.339	----	.7571
5. Structure & Climate	38.483	8.440	11 - 66	11 - 59	-0.404	-0.147	.8135
6. Home/Work	34.449	8.809	11 - 66	11 - 59	0.011	----	.7887
7. Composite OSI#	204.327	37.210	61 - 366	90 - 292	-0.315	----	.9406
Coping							
8. Recreational	27.707	8.523	6 - 48	8 - 48	-0.029	----	.8750
9. Physical	26.878	9.078	7 - 56	8 - 53	0.399	-0.021	.6756
10. Social Support	41.059	8.328	6 - 48	9 - 48	-1.737	0.268	.8874
11. Rational/Cognitive	26.420	5.646	5 - 40	9 - 39	-0.167	----	.6458
12. Composite Coping#	122.161	20.809	24 - 192	60 - 185	-0.037	----	.8268
Hardiness							
13. Control	54.829	7.440	10 - 80	34 - 74	-0.209	----	.5774
14. Commitment	56.966	8.805	10 - 80	29 - 80	-0.305	----	.7182
15. Challenge	48.898	8.080	10 - 80	26 - 70	-0.323	----	.6236
16. Hardiness	149.234	18.680	27 - 216	85 - 201	-0.429	-0.123	.8198
Strain							
17. Physical	85.332	21.565	20 - 160	20 - 148	-0.151	----	.8751
18. Psychological	42.673	12.547	10 - 80	10 - 76	0.056	----	.8756
19. Composite Strain#	113.663	27.333	27 - 216	27 - 196	-0.079	----	.9003

Note: n = 205; Composite# - Formed From Items Used in Sub-Scales; Scale Range+ - Variables Removed to Improve the Reliability or Face Validity of the Scale; Tran/Var Skew++ - Variable Transformed to Reduce Skewness.

Strain Scales

Mean scores for the strain scales are relatively similar to the expected mean values for the range of the response scales. The SD's for the scales, however, are substantially below the expected values for the observed range of responses. For the Physical Strain scale, the SD is 10.44 below the expected value (i.e., 32.00); that for the Psychological Strain scale 3.95 below the expected value (i.e., 16.50); and the SD for the Composite Strain scale 14.92 below the expected value (i.e., 121.50). Furthermore, although the responses to the scales are normally distributed, the observed range of responses for each scale is restricted at the high end of the scale and thus may account for their reduced variability of the strain scales. The Cronbach alpha coefficient for each scale, however, is high and indicates that the items in each scale have high internal consistency (i.e., high level of oneness).

Comparisons With Normative Data

Table G.2 compares the OSI common stressor scale means and SD's for the present study with those for the normative sample (Rees & Cooper, 1992b). In addition, the table compares the Cronbach alpha coefficients for the present study with sample data reported by Davis (1996).[G1]

When compared to the normative data for the OSI scales, the mean score for the "Relationships with People" scale is substantially below the normative value (i.e., 30.16) for the scale. Those for the other scales, however, tend to be slightly higher than the normative value for the respective scales. Conversely, the SD's for the scales are all below the normative values. Similarly, the alpha coefficients for the present study are all below those for the sample data reported by Davis (1996).

[G1] Note: As an index for the reliability of the OSI scales, the OSI manual and data supplement (see Cooper et al., 1988, 1989) supplies only normative data for split half reliability. Hence, to compare Cronbach alpha coefficients, it is necessary to use sample data from field research.

Table G.2
OSI Common Stressor Scales: Comparisons With Normative Data

Normative Statistic	Scale Mean		Scale SD		Cronbach alpha	
Variables	Norm#	Present	Norm#	Present	Norm##	Present
1. Intrinsic to Job	30.19	33.85	6.56	6.15	0.71	0.69
2. Managerial Role	35.53	35.72	8.54	7.22	0.84	0.73
3. Relationships	30.16	21.86	7.51	6.43	0.87	0.70
4. Career	28.02	31.87	8.23	7.35	0.80	0.76
5. Structure & Climate	38.14	38.48	9.24	8.44	0.84	0.81
6. Home/Work	31.00	34.45	10.22	8.81	0.85	0.79
Mean	32.17	32.70	8.38	7.40	0.82	0.75

Note: n = 205; Norm # - Normative Data (n = 6326) - See Rees & Cooper (1992b, Table 1, p. 84); Norm## - Sample Data (n = 336) - See Davis (1996, Table 1, p. 177).

G.1.1.2 Personal Desirability, Valence, Expectancy and Belief Scales

Descriptive data for the Personal Desirability, Valence, Expectancy, General Beliefs Social Support and Expectancy Psychological Stress scales is shown in Table G.3.

Personal Desirability

The mean scores for the Personal Desirability scales are all below the expected mean value for the range of the scale (i.e., 12.5 & 75.00) and reflects the significant positive skewness of the scales. By contrast, with the exception of the SD for the composite scale, the SD's for the scales tend to approximate the expected values for the range of observed responses. The SD for the composite scale (i.e., 14.299) is 2.95 below the expected value (i.e., 17.25) and reflects the restriction on scores at the high end of the scale (i.e., the maximum score is 103). Furthermore, the response distributions for the scales are all significantly skewed in the positive direction and indicates that the scores tend to cumulate toward the "imbalance" (i.e., "About Right") pole of the respective scales. Data transformations were used to transform the skewed distributions to normal distributions.

Table G.3
Descriptive Statistics: Personal Desirability, Stressor Valence, Stressor Expectancy, Expectancy Stress, and Belief Social Support Scales

Scale	Mean	SD	Scale Range	Observed Range	Skew	Tran/Var Skew++	Alpha
Personal Desirability							
1. Role-Ambiguity	10.054	3.400	----	5 - 19	0.455	0.146	.7250
2. Role-Boundary	8.454	2.759	----	5 - 18	0.986	0.234	.5877
3. Role-Insufficiency	11.390	3.491	5 - 20	5 - 20	0.432	-0.179	.7120
4. Role-Overload	9.078	3.046	----	5 - 19	0.954	0.268	.6455
5. Role-Responsibility	8.302	3.132	----	5 - 19	1.141	0.012	.7113
6. Physical Environ	9.912	3.114	----	5 - 20	0.628	-0.015	.5627
7. Comp Pers Desir #	57.210	14.299	30 - 120	34 - 103	0.747	0.160	.8909
Stressor Valence							
8. Role-Ambiguity	13.200	2.529	----	4 - 16	-1.348	0.032	.6776
9. Role-Boundary	11.644	2.624	----	2 - 16	-0.880	0.091	.5460
10. Role-Insufficiency	11.820	2.521	2 - 16	3 - 16	-0.845	0.034	.3900
11. Role-Overload	12.463	3.115	----	4 - 16	-0.883	0.036	.5151
12. Role-Responsibility	9.649	2.969	----	3 - 16	0.039	----	.6220
13. Physical Environ	11.907	2.412	----	4 - 16	-0.785	0.044	.3272
14. Composite Valence #	70.683	10.925	12 - 96	30 - 96	-1.012	0.092	.7939
Stressor Expectancy							
15. Role-Ambiguity	12.590	2.863	----	2 - 16	-1.684	0.095	.8622
16. Role-Boundary	10.210	3.066	----	2 - 16	-0.537	-0.034	.5961
17. Role-Insufficiency	10.390	3.161	2 - 16	2 - 16	-0.457	-0.075	.5770
18. Role-Overload	13.761	2.591	----	2 - 16	-2.041	-0.016	.7856
19. Role-Responsibility	9.893	3.736	----	2 - 16	-0.366	-0.209	.8038
20. Physical Environ	12.273	2.794	----	4 - 16	-1.021	0.027	.6085
21. Composite Expect #	69.156	12.904	12 - 96	24 - 93	-1.031	0.191	.8602
Belief							
22. Social Supp Demand	20.512	6.841	5 - 40	5 - 39	0.188	----	.6970
Expectancy							
23. Psychological Stress	30.039	5.360	5 - 40	12 - 40	-0.672	-0.003	.7029

Note: n = 205; Composite# - Formed From Items used in Sub-Scales; Tran/Var Skew++ - Variable Transformed to Reduce Skewness.

The Cronbach alpha coefficients for the personal desirability sub-scales range from mediocre to moderate. They vary from a minimum of 0.5627 for the Physical Environment scale to a maximum of 0.7250 for the Role-Ambiguity scale. By contrast, the internal consistency of the Composite Personal Desirability scale is high (i.e., α =

0.8909) and likely reflects the increased number of items in the scale. Furthermore, when compared to the data for study six (see Appendix F.1.1.1, Table F.1), the alpha coefficients are generally higher than those obtained using a six point response format. Those from study six average 0.63 and those from the present study, a higher 0.69.

Stressor Valence

With the exception of the mean score for the Role-Responsibility scale, the mean scores for the valence scales are all higher than the expected values (i.e., 9.0 & 54.0) for the range of the response scales and reflect the significant negative skewness of the respective scales. That is, with the exception of the responses to Role-Responsibility scale which are normally distributed, the data indicates that the responses to the valence items tend to cumulate toward the "Most definitely bad" pole of the response scales. Further, with the exception of the overload and responsibility scales, the SD's for the scales are somewhat below the expected values for the observed range of responses. In particular, the SD for the Composite Valence scale (i.e., 10.925) is 5.58 below the expected value for the scale (i.e., 16.50) and reflects the constriction in the minimum scores for the scale. That is, the minimum observed score of 30 is substantially higher than the theoretical minimum value of 12 for the scale. Furthermore, with the exception of the Role-Responsibility scale, although the observed range of responses reflects the range of scale, the distributions are significantly skewed in the negative direction and suggests that some form of bias common to the sample underlies the response to the valence items. As a result, data transformations were used to transform the scales with skewed distributions to normal distributions.

The internal consistency of the valence scales range from poor to moderate. The alpha coefficients range from a low 0.3272 and 0.3900 for the Physical Environment and Role-Insufficiency scales to a maximum of 0.7939 for the 12 item Composite Valence scale. Furthermore, when compared to the results for study one (see Appendix A.1.2, Table A.1 & Appendix A.1.3, Table A.2), the alpha coefficients are generally higher than those for the previous study. For instance, those for study one average a low 0.47 and those for the present study, a somewhat higher 0.55.

Stressor Expectancy

The mean scores for the expectancy scales are all higher than the expected mean value for the range of the scale and reflect the negative skewness of the response distributions for each scale. In contrast, the SD's for the scales are all below the expected value for the range of observed responses. For instance, the SD for the Composite Expectancy scale (i.e., 12.904) is 4.35 below the expected value for the scale (i.e., 17.25) and would seem to reflect a restriction in the response to the low end of the scale. That is, the minimum score of 24 indicates that the participants have tended to avoided the use of the "most certainly unlikely to cause me stress" pole of the scale in their response to items in the expectancy scales. Furthermore, although the observed range of responses tends to reflect the available range of the response scales, the response distributions are all significantly skewed toward the negative pole or "Most certainly likely to cause me stress" response anchor. In other words, the data suggests that some form of response bias underlies the participants response to the expectancy items. As indicated, data transformations were used to transform the skewness of the expectancy scales to normal distributions.

The Cronbach alpha coefficients for the expectancy scales indicate that the internal consistency of the scales is generally moderate. The coefficients range from a marginal 0.5770 for the Role-Insufficiency scale to a maximum of 0.8622 for the Role-Ambiguity scale. Furthermore, when compared to the data for study one (see Tables 3.2.1 and 3.2.2), the internal consistency of four of the scales tends to be slightly higher for the present study. For example, the alpha coefficient for the Composite Expectancy scale increases from 0.81 to 0.86 for the present study. When seem in average terms, however, the alpha coefficients are essentially equal. Those for study one average a moderate 0.74 and those for present study, a slightly lower 0.73.

Belief Social Support and Expectancy Psychological Stress

The mean score for the Belief Social Support scale (i.e., 20.512) is slightly below the expected value for the range of the scale (i.e., 22.5) and the SD (i.e., 6.841) for the scale, 1.66 below the expected value for the observed range of responses. In both cases, the reduced values would seem to reflect the minor positive skewness of the responses to the scale. In addition, the 0.6970 alpha coefficient for the scale indicates that the items in the scale have moderate internal consistency. Further, due to the change in the response format for the scale, it not possible to compare the mean and SD with those from study four. With respect to the alpha coefficients, however, the coefficient for the present study (i.e., $\alpha = 0.6970$) is a substantially higher than the value obtained in study four from the use of a three point yes/no/sometimes response format (i.e., $\alpha = 0.5510$).

The mean score for the Expectancy Psychological Stress scale (i.e., 30.04), however, is substantially higher than the expected mean value for the range of the scale (i.e., 22.5) and reflects the significant negative skewness of the response distribution for the scale. That is, the responses to items in the scale are significantly skewed toward the "Most Certainly Likely" pole of the scale (see Appendix G.6.10). In addition, the SD

for the scale is less than the expected value for the observed range of responses and seemingly results from the restriction on scores at the "Most Certainly Unlikely" pole of the response scale. As the data shows, although the scale allows a minimum score of 5, the observed minimum score of 12 is somewhat higher than the theoretical value. In addition, the alpha coefficient for the scale (i.e., $\alpha = 0.7029$) indicates that the internal consistency of the scale items is moderate. Further, similar to the Belief Social Support scale, due to a change in the response format for the scale it is not possible to compare the mean scores and SD's with those obtained in study four. When related to the alpha coefficients, however, the coefficient for the present study is slightly below the alpha coefficient obtained in study four from the use of a three point yes/no/sometimes response format (i.e., $\alpha = 0.7894$).

G.1.1.3 Personal Desirability Scale: Response Distributions

Table G.4 shows the frequency of the responses to the "Like More" (i.e., response values "4" "3" "2") "About Right" (i.e., response values "1" "-1") and "Like Less" (i.e., response values "-2" "-3" "-4") response anchors of the Personal Desirability scale. The majority of responses to the Personal Desirability scale fall in the "About Right" response segment of the scale. As Table G.4 indicates, 46.26% of the total responses (i.e., 6210) fall within this region of the scale; in contrast, 36.76% fall within the "Like More" segment of the scale; and a disproportionate 16.97% in the "Like Less" segment of the scale. Furthermore, when the response distribution is compared to that expected from a normal distribution, there is a shortfall of approximately 22.0% in the number of responses expected (i.e., 68.26%) for the "About Right" anchor of the scale and an excess of approximately 20.89% in the number of responses expected (i.e., 15.87%) for

the "Like More" anchor of the scale. That is, for a normal distribution, 68.26% of the responses would be expected to fall in the "About Right" segment of the scale and 15.87% in both the "Like More" and "Like Less" segments of the scale.

Table G.4
Personal Desirability Stressor Scales: Response Distribution Comparisons

Scale Response	Like More#		About Right#		Like Less#		Goodness of Fit
Variables	**n**	**%**	**n**	**%**	**n**	**%**	χ^2
Role-Ambiguity	564	54.49	419	40.48	52	5.02	403.728, p .000
Role-Boundary	217	20.97	566	54.69	252	24.35	214.128, p .000
Role-Insufficiency	719	69.47	308	29.76	8	0.77	738.591, p .000
Role-Overload	208	20.10	526	50.82	301	29.08	154.974, p .000
Role-Responsibility	223	21.55	601	58.07	211	20.39	285.148, p .000
Physical Environment	352	34.01	453	43.77	230	22.22	72.284, p .000
Total Responses	2283	36.76	2873	46.26	1054	16.97	832.094, p .000
Average Responses	380.50	36.76	478.83	46.26	175.67	16.97	----

Note: n = 207; Response Scale Anchors: Like More# 4 3 2; About Right# 1 -1; Like Less# -2 -3 -4;
Total Responses RA RB RI RO RS PH Scales = 6210.

Furthermore, when the data is related to the respective Personal Desirability scales, the percentage of responses for the "About Right" anchor range from a low 29.76% for the Role-Insufficiency scale to a maximum of 58.07% for the Role-Responsibility scale. In contrast, responses to the "Like More" anchor of the scale range from 20.10% for Role-Overload scale to a maximum of 69.47% for the Role-Insufficiency scale; and those for the "like Less" anchor of the scale, from a minimum of 0.77% for the Role-Insufficiency scale to a maximum of 29.08% for the Role-Overload scale. Thus, on the basis of this distribution, the response distributions for the "Like Less" anchors of the Role-Ambiguity (i.e., 5.02%) and Role-Insufficiency (i.e., 0.77%) scales do not attract

sufficient responses to form a normal distribution of the responses. Furthermore, in contrast to the expected U distribution of the responses to each scale, it indicates that the response to both scales is essentially linear in nature.

Furthermore, as shown in the table, Chi-Square (X^2) goodness of fit statistics for each scale indicate that the distribution of responses to each scale is not by chance. That is, they indicate that some underlying factor in common with the scale has determined the individual's response to the items in the respective scales.

G.1.1.4 Personal Desirability Scale: Response Anchor Descriptive Statistics

Table G.5, shows the descriptive data related to the response anchors of the Personal Desirability Stressor scales. Further, to equalise the scale range for each scale, the response values corresponding to each response anchor were recoded to the following values: the "Like More" segment of the scale to the values 4 3 2 0 0 0 0 0; the "About Right" segment of the scale to the values 0 0 0 4 4 0 0 0; and the "Like Less" segment of the scale, to the values: 0 0 0 0 0 2 3 4.

Descriptive Statistics

With the exception of the Role-Insufficiency scale, the mean scores for the "Like More" scales are substantially less than the mean scores expected from the observed range of responses (i.e., 10.0 and 60.00) and reflect constrictions in the range of responses and the positive skewness of the response distributions. In particular, the mean scores for the Role-Boundary (i.e., 2.478), Role-Overload (i.e., 2.527) and Role-Responsibility (i.e., 2.620) scales are substantially below the midpoint for the scale and reflect the significant positive skewness of the responses to these scales. That is, the responses are

skewed toward the zero or "satisfied" pole of the response scale. By contrast, with the exception of the Role-Insufficiency scale (i.e., 6.010), the mean scores for the "About Right" anchor of the scale tend to approximate the expected mean for the scale (i.e., 10.00 and 60.00) and reflect the wide variability in the range of responses and the more normal distributions of the respective scales. Mean scores for the "Like Less" scales, however, are all substantially less than the expected value. The value for each scale reflecting the effect of constrictions in range of responses and the significant positive skewness in the response distributions for each of the scales. For example, the range of the responses for the insufficiency scale fall within the range 0 - 3 and further reflects in the high positive skew coefficient (i.e., 5.522) for this scale. Thus, on the basis of these results, the response distributions for the "Like More" and "Like Less" scales tend to be tied or gather toward to the "satisfied" pole (i.e., "About Right") of each scale.

With the exception of the SD's for the overload, responsibility and composite "Like More" scales, the SD's for the scales largely reflect the expected values for the observed range of responses. Whereas for those with low SD's, restrictions in the variability of the data and positive skewness in the distribution of the responses subsequently reflects in reduced SD's. For example, the range of responses for the composite scale is confined in the range 2 - 67 and the response distribution is significantly skewed (i.e., skew = 0.421) in the positive direction. By contrast, the SD's for the "About Right" scales tend to approximate those expected from the observed range of responses and the response distributions with the exception of the ambiguity and insufficiency scales, are normally distributed. Similarly, with the exception of the ambiguity, insufficiency and composite scales, the SD's for the "Like Less" scales tend to reflect the expected

mean value for the range of observed responses. The low SD's for the ambiguity, insufficiency and composite scales reflecting the abnormal constrictions in the observed range of responses and extreme positive skewness in the distribution of the responses to the items in these scales.

Table G.5
Descriptive Statistics: "Like More" "About Right" and "Like Less" Personal Desirability Response scales

Scale	Mean	SD	Scale Range	Observed Range	Skew	Tran/Var Skew++	Alpha
"Like More" Response Scale							
Evaluative Stressor							
Role-Ambiguity	7.312	4.434	----	0 - 18	0.110	----	.7128
Role-Boundary	2.478	2.541	----	0 - 11	0.986	0.143	.3847
Role-Insufficiency	9.810	4.732	0 - 20	0 - 20	0.056	----	.6876
Role-Overload	2.527	2.287	----	0 - 12	1.288	-0.037	.3016
Role-Responsibility	2.620	2.949	----	0 - 15	1.404	0.286	.4975
Physical Environment	4.629	2.960	----	0 - 14	0.468	-0.110	.2788
Composite Pers Desir	29.376	13.997	0 - 120	2 - 67	0.421	-0.254	.8285
"About Right" Response Scale							
Evaluative Stressor							
Role-Ambiguity	8.156	5.899	----	0 - 20	0.580	0.058	.6422
Role-Boundary	11.044	5.562	----	0 - 20	-0.116	----	.4844
Role-Insufficiency	6.010	5.439	0 - 20	0 - 20	0.639	0.136	.5488
Role-Overload	10.263	5.272	----	0 - 20	-0.027	----	.4307
Role-Responsibility	11.727	5.987	----	0 - 20	-0.316	----	.5914
Physical Environment	8.839	5.474	----	0 - 20	0.137	----	.4621
Composite Pers Desir	56.039	23.334	0 - 120	4 - 112	0.090	----	.8272
"Like Less" Response Scale							
Evaluative Stressor							
Role-Ambiguity	0.702	1.567	----	0 - 11	3.044	-1.447	.3148
Role-Boundary	3.200	3.246	----	0 - 14	0.878	0.068	.5187
Role-Insufficiency	0.078	0.424	0 - 20	0 - 3	5.522	-5.214	-.0255+
Role-Overload	3.399	3.627	----	0 - 16	0.950	-0.139	.5738
Role-Responsibility	2.746	3.789	----	0 - 17	1.597	-0.170	.7101
Physical Environment	3.073	2.762	----	0 - 13	0.910	-0.122	.3742+
Composite Pers Desir	13.824	10.086	0 - 120	0 - 56	1.172	-0.145	.7593+

Note: n = 205; Composite - Scale Formed From Sub-Scales; Tran/Var Skew++ - Variable Transformed to Reduce Skewness. Response Scale 4 3 2 1 -1 -2 -3 -4 Recoded: a) "Like More" - 4 3 2 0 0 0 0; b) "About Right" 0 0 0 4 4 0 0 0; c) "Like Less" 0 0 0 0 0 2 3 4; Alpha+ - Items Deleted From the Cronbach Alpha Calculation Due Zero Variance: RI - 3 items , PE - 1 item, Eval Comp - 4 Items.

With the exception of the skewed distributions for the "Like Less" Role-Ambiguity and Role-Insufficiency scales, data transformations were able to transform the scales with skewed response distributions to approximate normality. However, due to extreme skewness and low number of responses (see Tables G.4 & G.5) for the "Like Less" Role-Ambiguity and Role-Insufficiency scales, they were dropped from subsequent analyses.

The Cronbach alpha coefficients for the scales indicate that the internal consistency of the items in the scales range from extremely poor to moderate. Those for the "Like More" scales average 0.53 and range from a low 0.28 for the Physical Environment scale to a maximum of 0.83 for the composite scale; those for the "About Right" scale, average a higher 0.57 and range from a low 0.43 for the Role-Overload scale to a maximum of 0.83 for the composite scale; and those for the "Like Less" scale, average a low 0.46 and range from a poor -0.03 for the Role-Insufficiency scale to a moderate 0.76 for the composite scale.

G.2 Regression Analyses

Tables G.6 to G.15 summarise the results from a series of backward and hierarchical modelling regression models which explore the relative effect of common study stressors (i.e., recognition of common stressors), the personal meaning assigned to intrinsic and extrinsic sources of stress, coping strategies and dispositions for hardiness on dimensions of strain. In particular, the analyses sought to identify the models of best fit which best predict physical, psychological and composite symptoms of strain; and from these analyses, test the theoretical importance and identify the incremental effect of significant (a) personal meaning appraisal process when placed in the presence of significant predictors of strain and (b) personal desirability appraisal processes when placed in

the presence of significant predictors of strain. Following this, the analyses then sought to further explore the effect of "Like More" "About Right" and "Like Less" personal desirability appraisal processes on the explanation of physical and psychological strain.

Tables G.6 to G.9 present a summary of the results from a series of "model building" analyses which explore the relative effect of (a) personal meaning appraisal processes; and (b) significant personal meaning appraisal processes when in the presence of significant common study stressor, coping and hardiness cognitive processes on physical and psychological strain. Table G.10, the results from models of best fit which sought to identify the most parsimonious explanation for the variance in physical, psychological and composite symptoms of strain reported by the sample. Tables G.11 and G.12 the results from hierarchical modelling which sought to test the principal hypothesis of this thesis and identify the incremental effect of specific and general appraisal processes on physical and psychological symptoms of strain. That is, these analysis sought to identify the theoretical importance and incremental effect of significant personal meaning appraisal processes on symptoms of strain when placed in the presence of significant hardiness, common study stressor and coping cognitive processes. Following these analyses, Table G.13 shows the results from a hierarchical analysis which sought to test the theoretical importance and identify the incremental effect of significant personal desirability predictors of strain on the variance in physical symptoms of strain when placed in the presence of significant predictors of strain. Finally, Tables G.14 and G.15 show a summary of the results from a series of regression analyses which further explore the relative effect of the personal desirability assigned to stressors in terms of "Like More" "About Right" and "Like Less" on physical and psychological symptoms of strain.

For each regression model, an alpha pout at ≥ .051 (Two Tailed) is used to (a) effect the removal of a variable from the regression model or (b) interpret the data in the equations for hierarchical models.

G.2.1 Model Building Analyses

The results for *model building* analyses which explore the relative effect of specific personal meaning appraisal processes (i.e., valence, expectancy and belief) on physical and psychological strain is shown in Table G.6. As the table shows, the Expectancy Psychological Stress, Expectancy Physical Environment and Belief Social Support scales explain a moderate 27.49% (26.41% adj) of the variance in physical strain and a similar 27.55% (26.47% adj) of the variance in psychological strain. Further, as the valence assigned to common study stressors was not a significant predictor of strain in any of the models, the valence scales were deleted from subsequent analyses.

Table G.6
Backward Regression - Model Building Analyses: Dimensions of Personal Meaning (Specific Appraisals) - Physical and Psychological Strain on Significant Expectancy, Valence, Beliefs Social Support and Expectancy Psychological Stress Scales

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Physical Strain	Expect Psych Stress#	27.49%	26.41%	-0.3903	-6.149	.0000
	Expect Physical Environ#			-0.1687	-2.621	.0094
	Belief Social Support			0.1429	2.278	.0238
Mult R=.5244; SE 18.4991; F(3,201), 25.4065; p .0000						
Psychological Strain	Expect Psych Stress#	27.55%	26.47%	-0.3561	-5.613	.0000
	Belief Social Support			0.2110	3.366	.0009
	Expect Physical Environ#			-0.1559	-2.421	.0164
Mult R=.5249; SE 10.7597; F(3,201), 25.4728; p .0000						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale

The relative effect of the more general personal meaning (i.e., the personal desirability of stressors) appraisal processes and significant personal meaning appraisal processes (i.e., specific appraisals) on physical and psychological strain is summarised in Table G.7. As the table shows, for each model, both specific (i.e., expectancy and belief) and more general appraisal processes contribute significant information to the explained variance in physical and psychological strain. In particular, the personal desirability of role-ambiguity stressors explains a significant percentage of the variance in the physical strain; and the personal desirability of role-boundary stressors, a significant percentage of the variance in the psychological strain model.

Table G.7
Backward Regression - Model Building Analyses: Dimensions of Personal Meaning (Specific and General Appraisals) - Physical and Psychological Strain on Significant Personal Desirability, Expectancy, Beliefs Social Support and Expectancy Psychological Stress Predictors of Strain.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Physical Strain	Expect Psych Stress#	30.90%	29.51%	-0.3590	-5.706	.0000
	Pers Desir R-Ambiguity#			0.1898	3.137	.0020
	Expect Physical Environ#			-0.1538	-2.435	.0158
	Belief Social Support			0.1274	2.069	.0398
Mult R=.5558; SE 18.1052; F(4,200), 22.3536; p .0000						
Psychological Strain	Expect Psych Stress#	29.52%	28.11%	-0.3312	-5.207	.0000
	Belief Social Support			0.1952	3.130	.0020
	Expect Physical Environ#			-0.1532	-2.407	.0170
	Pers Desir R-Boundary#			0.1444	2.368	.0189
Mult R=.5433; SE 10.6385; F(4,200), 20.9437; p .0000						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale

Further, as evident from the table, the relative effect of specific and general appraisal processes explains a moderate and increased 30.90% (29.51% adj) of the variance in physical strain; and a similar 29.52% (28.11% adj) of the variance in psychological strain. In addition, for each model, the Expectancy Psychological Stress scale is the most powerful predictor of strain in the final solution.

The results in Table G.8 show the relative effect of significant specific and more general appraisal processes on the variance in physical and psychological strain when in the presence of significant common stressors. For each model, the results show that the personal meaning assigned to stressors (i.e., individual differences in the appraisal of stressors) contributes significant information to the explained variance when in the presence of common study stressors.

As shown in the table, expectancies for psychological strain and the personal desirability of role-ambiguity stressors predict a significant percentage of the variance in physical strain; and expectancies for psychological strain and beliefs related to social support, a significant percentage of the variance in psychological strain. Specifically, the physical strain model explains a moderate and increased 32.97% (31.97% adj) of the variance in physical symptoms of strain; and the psychological strain model, a somewhat lower 29.67% (28.625 adj) of the variance in psychological symptoms of strain.

Further, when compared to the variance in composite strain explained by the OSI Composite scale (see Table 5.4.17), the relative effect of expectancies for psychological strain, beliefs associated with social support and the personal desirability assigned to role-ambiguity stressors accounts for an additional 10.87% (10.05% adj) of the variance in symptoms of physical strain and 7.57% (6.70% adj) of the variance in psychological

strain. Equally interesting, the Expectancy Psychological Stress scale is the most influential predictor of strain in the solution for each model. Conversely, expectancies for physical environment stressors were non-significant predictors of strain in either of the models. As a result, the expectancy scales were deleted from subsequent analyses.

Table G.8
Backward Regression - Model Building Analyses: OSI Stressors and Dimensions of Personal Meaning - Physical and Psychological Strain on Significant OSI Stressor, Personal Desirability, Expectancy, Beliefs Social Support and Expectancy Psychological Stress Predictors of Strain.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Physical Strain	Expect Psych Stress#			-0.3376	-5.427	.0000
	OSI Composite	32.97%	31.97%	0.2870	4.416	.0000
	Pers Desir R-Ambiguity#			0.1337	2.160	.0319
Mult R=.5742; SE 17.7869; F(3,201), 32.9547; p .0000						
Psychological Strain	Expect Psych Stress#			-0.3244	-5.087	.0000
	OSI Composite	29.67%	28.62%	0.2286	3.480	.0006
	Belief Social Support			0.1872	2.996	.0031
Mult R=.5447; SE 10.6009; F(3,201), 28.2650; p .0000						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale

Table G.9 shows the results from the final "model building" analysis which sought to identify the relative effect of coping strategies on symptoms of physical and psychological strain when in the presence of significant common study stressor and personal meaning predictors of strain. As the table shows, coping strategies account for a significant percentage of the variance in physical and psychological symptoms of strain when in the presence of significant common study stressor and personal meaning predictors of strain. As a result, each of the coping strategies were retained for subsequent analyses.

The physical strain model explains a high and substantially increased 39.68% (38.16% adj) of the variance in physical symptoms of strain from the inclusion of coping strategies in the model; and the psychological strain model, a similar 39.04% (37.18% adj) of the variance in psychological symptoms of strain. Therefore, if seen in incremental terms, the physical strain model explains an additional 6.71% (6.19% adj) of the variance in physical symptoms of strain from the inclusion of coping strategies in the model; and the psychological strain model, an additional 9.37% (8.56% adj) of the variance in psychological symptoms of strain.

Table G.9
Backward Regression - Model Building Analyses: OSI Common Stressors, Personal Meaning and Coping - Physical and Psychological Strain on Significant OSI Stressor, Personal Desirability, Expectancy, Belief Social Support, Expectancy Psychological Stress and Coping Predictors of Strain.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Physical Strain	Expect Psych Stress#	39.68%	38.16%	-0.2900	-4.672	.0000
	Physical Coping#			-0.2475	-4.146	.0001
	OSI Composite			0.1879	2.867	.0046
	Belief Social Support			0.1455	2.441	.0155
	Pers Desir R-Ambiguity#			0.1264	2.126	.0347
Mult R=.6299; SE 16.8998; F(5,198), 26.0530; p .0000						
Psychological Strain	Expect Psych Stress#	39.04%	37.18%	-0.2671	-4.265	.0000
	Recreational Coping			-0.2349	-3.844	.0002
	Belief Social Support			0.1596	2.673	.0081
	Rational/Cognitive Coping			-0.1366	-2.353	.0196
	OSI Composite			0.1305	2.037	.0430
	Social Support Coping#			0.1177	1.964	.0510
Mult R=.6248; SE 9.9480; F(6,197), 21.0261; p .0000						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale; Composite Stain Model - One Case Identified as Multivariate Outlier (i.e., At α 0.001& 7df, Mahal = 25.592 ≥ χ^2 = 24.322) and Deleted From the Analyses.

Further, the solutions for both models indicate that both recognition and personal meaning cognitive processes contribute useful information to the variance in strain explained by the respective model. That is, they indicate that the relative effect of com-

mon study stressors, expectancies for psychological stress and beliefs related to social support each explain a significant percentage of the variance in symptoms of physical and psychological strain. Conversely, the relative importance of the personal desirability assigned to common study stressors was significant only in the physical strain model. Moreover, for each model, the relative effect of expectancies for psychological stress is the most powerful predictor of strain in the models.

G.2.2 Models of Best Fit

The models of best fit sought to identify (a) the relative effect of control, commitment and challenge dimensions of hardiness when included in the presence of significant common study stressor, personal meaning and coping strategy predictors of strain; and (b) the most parsimonious explanation for the variance in physical and psychological symptoms of strain reported by the sample.

As the results in Table G.10 show, control and commitment dimensions of hardiness add significant information to the explanation of the variance in physical symptoms of strain; commitment and challenge hardiness cognitive styles significant information to the explanation of the variance in psychological symptoms of strain. Further, as evident from the results, the physical strain model explains an increased and high 46.28% (44.64% adj) of the variance in physical symptoms of strain; and the psychological strain model, a slightly lower 43.38% (41.95% adj) of the variance in psychological symptoms of strain. That is, in comparison to the final model building analyses, the physical strain model accounts for an additional 6.60 (6.48% adj) of the variance in physical strain; and the psychological strain model, an additional 4.34% (4.77% adj) of the variance in psychological strain. Moreover, as evident in the results for each model, the relative effect of expectancies for psychological stress is the most powerful predictor of strain in each solution.

Table G.10
Backward Regression - Models of Best Fit: OSI Common Stressors, Personal Meaning, Coping and Hardiness - Physical and Psychological Strain on Significant OSI Stressor, Personal Desirability, Expectancy, Belief Social Support, Expectancy Psychological Stress, Coping and Hardiness Predictors of Strain.

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
Physical Strain	Expect Psych Stress#	46.28%	44.64%	-0.2781	-4.738	.0000
	OSI Composite			0.1862	3.077	.0024
	Control			-0.1764	-2.577	.0107
	Commitment			-0.1732	-2.476	.0141
	Pers Desir R-Ambiguity#			0.1340	2.383	.0181
	Physical Coping#			-0.1254	-2.180	.0305
Mult R=.6802; SE 15.9900; F(6,197), 28.2799; p .0000						
Psychological Strain	Commitment	43.38%	41.95%	-0.2690	-4.607	.0000
	Expect Psych Stress#			-0.2571	-4.426	.0000
	Belief Social Support			-0.2240	-3.914	.0001
	Recreational Coping			0.1742	3.140	.0019
	Challenge			-0.1292	-2.203	.0288
Mult R=.6586; SE 9.5634; F(5,198), 30.3338; p .0000						

Note: pout ≥ 0.051 (two-tail); #Transformed Scale; One case Identified as Multivariate Outlier (i.e., At α 0.001 & 6df, Mahal = 24.700 ≥ χ^2 = 22.458) and Deleted From Both Best Fit and Hierarchical Analyses.

With respect to the models of best fit, the significant predictors of strain in each model represent the models of best fit which best explain the variability in physical and psychological symptoms of strain reported by the sample. However, when the models are used to identify the most parsimonious explanation for the symptoms of strain reported by the sample, the composite strain model may be seen as the model of best fit for the sample. In comparison to the other models, it (a) identifies the most predictors of strain; (b) with the exception of dispositions for challenge, includes the significant predictors of physical and psychological strain identified in the respective models; and (c) using a multidimensional measure of strain, explains the highest percentage of the variance in symptoms of strain. Furthermore, in comparison to the other models, it identifies both belief social support and personal desirability appraisal processes as sig-

nificant predictors of strain. As the results show, in addition to common study stressor and coping cognitive processes, the model identifies specific (i.e., expectancy psychological stress and beliefs social support) and more general (i.e., personal desirability of role-ambiguity stressors, commitment and control hardiness cognitive styles) appraisal processes as significant predictors of strain.

G.2.3 Hypothesis Testing and Incremental Effect of Specific and General Appraisal Processes on Strain

Drawing on the results in Table G.10, hierarchical modelling was used to test the theoretical importance and identify the incremental effect of (a) specific and more general personal meaning appraisal processes and (b) personal desirability appraisal processes in the stressor to strain relationship. That is, these analyses were used to test the principal hypothesis of the thesis (H1) that the incremental effect of the personal meaning assigned to sources of stress will add significant information to the cumulative variance in symptoms of composite strain explained by the model. In addition, they sought to test the hypothesis (H2) that the personal desirability assigned to sources of stress will add useful information to the cumulative variance in physical and psychological symptoms of strain explained by the model.

The results in Tables G.11 and G.12 further demonstrate (a) the theoretical importance of personal meaning in the stressor to strain process and (b) that the incremental effect of the personal meaning assigned to sources of stress adds useful information to the cumulative variance in physical and psychological strain.

As the results in Table G.11 show, the incremental effect of expectancy psychological stress, belief social support and personal desirability appraisal processes add 9.08% (8.44% adj) to the 23.94% (23.18% adj) explained by commitment and control hardiness cognitive styles and the 14.27% (13.79% adj) explained by OSI common study

stressors and physical coping cognitive processes. That is, having partialled out or partioned the variance common to (a) dispositions for hardiness, (b) common study stressors and (c) coping cognitive processes, the incremental effect of personal meaning appraisal processes adds a unique and significant 9.08% (8.44% adj) to the cumulative variance in physical symptoms of strain.

Table G.11
Hierarchical Regression: Physical Strain on Hardiness, OSI Common Stressor, Coping, Expectancy Psychological Stress, Personal Desirability and Belief Social Support.

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
	Step 1								
Hardiness	Commitment	23.94%	23.18%	23.94%	.0000	-0.3208	-1.184 - -0.405	-4.025	.0001
	Control					-0.2181	-1.082 - -0.176	-2.737	.0068
Mult R=.4892; SE 18.8358; F(2,201) 31.6250; p .0000									
	Step 2								
Stressor/ Coping	OSI Composite	38.21%	36.97%	14.27%	.0000	0.3193	0.119 - 0.253	5.469	.0000
	Physical Coping#					-0.1823	-7.400 - -1.553	-3.020	.0029
Mult R=.6181; SE 17.0621; F(4,199) 30.7618; p .0000									
	Step 3								
Expectancy /Belief/ Desirability	Exp Psyc Stress#					-0.2617	-9.911 - -3.817	-4.443	.0000
	Role-Ambiguity#	47.29%	45.41%	9.08%	.0000	0.1295	0.776 - 9.616	2.318	.0215
	Blf Social Supp					0.1098	-0.005 - 0.696	1.945	.0532
Mult R=.6877; SE 15.8782; F(7,196) 25.1230; p .0000									

Note: # Transformed Variable

Furthermore, when compared to the 23.94% (23.18% adj) of the variance explained by dispositional factors in the model, the combined effect of recognition (i.e., common study stressor and coping) and personal meaning cognitive processes account for an additional 23.35% (22.23% adj) of the variance in physical symptoms of strain. Therefore, and directly relevant to the principal aim of this thesis, this result demonstrates that recognition and personal meaning cognitive processes have, it would seem, equal

importance in the mental algorithm underlying the appraisal of an imbalance between actual (i.e., recognition) and ideal (i.e., personal meaning) stressors. Moreover, if distinguished in terms of theoretical importance, they demonstrate that recognition cognitive processes account for only 14.27% (13.79% adj) of the variance in symptoms of physical strain and the spectrum of appraisal processes, a dominant 33.02% (31.62% adj) of the variance in physical strain. That is, if seen in proportional terms, the incremental effect of recognition cognitive processes account for 30.18% of the variance explained by the model and appraisal processes, 69.82% of the variance explained by the model.

Similar to the results for physical strain, the results for the psychological strain model (see Table G.12) show that the incremental effect of expectancy psychological stress and belief social support appraisal processes add 9.87% (9.44% adj) to the 25.50% (24.76% adj) explained by commitment and challenge hardiness cognitive styles and the 8.01% (7.75% adj) explained by physical coping cognitive processes. That is, having partialled out or partioned the variance common to (a) dispositions for hardiness, and (b) coping cognitive processes, the incremental effect of personal meaning appraisal processes adds a unique and significant 9.87% (9.44% adj) to the cumulative variance in psychological symptoms of strain.

Furthermore, when compared to the 25.50% (24.76% adj) of the variance explained by dispositional factors in the model, the combined effect of recognition (i.e., coping) and personal meaning cognitive processes account for an additional but lower 17.88% (17.19% adj) of the variance in psychological strain. Therefore, this result demonstrates that both recognition and personal meaning cognitive processes are significantly in-

volved in the mental algorithm underlying the appraisal of an imbalance between actual (i.e., recognition) and ideal (i.e., personal meaning) stressors. In addition, and perhaps the more relevant to the principal aim of this thesis, they indicate that the recognition of common study stressors is not necessarily a significant or influential cognitive process underlying the stressor to strain relationship. Moreover, if the results for the model are distinguished in terms of theoretical importance, they demonstrate that the incremental effect of recognition cognitive processes account for only 8.01% (7.75% adj) of the variance in symptoms of psychological strain and the spectrum of appraisal processes, a dominant 35.37% (34.20% adj) of the variance in psychological strain. That is, if seen in proportional terms, recognition cognitive processes account for only 18.47% of the variance explained by the model and the effect of appraisal processes, a substantially higher 81.53% of the variance explained by the model.

Table G.12
Hierarchical Regression: Psychological Strain on Hardiness, Coping, Expectancy Psychological Stress and Belief Social Support

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
	Step 1								
Hardiness	Commitment	25.50%	24.76%	25.50%	.0000	-0.3693	-0.719 - -0.350	-5.711	.0000
	Challenge					-0.2418	-0.719 - -0.350	-3.740	.0002
Mult R=.5050; SE 10.8875; F(2,201) 34.3944; p. 0000									
	Step 2								
Coping	Recreational	33.51%	32.51%	8.01%	.0000	-0.2955	-0.617 - -0.263	-4.909	.0000
Mult R=.5789; SE 10.3111; F(3,200) 33.5973; p. 0000									
	Step 3								
Expectancy /Belief	Exp Psyc Stress#	43.76%	41.95%	9.87%	.0000	-0.2571	-5.694 - -2.184	-4.426	.0000
	Blf Social Supp					-0.1742	0.119 - 0.521	3.140	.0019
Mult R=.6586; SE 9.5634; F(5,198) 30.3338; p. 0000									

Note: # Transformed Variable

Accordingly, on the basis of the results for the physical and psychological strain models, there was support for the principal hypothesis of the thesis (H1) that the personal meaning assigned to sources of stress would account for a significant percentage of explained variance in symptoms of strain when placed in the presence of dispositional, recognition and coping cognitive processes.

Table G.13 demonstrates that the personal desirability of role-ambiguity stressors explains a significant percentage of the cumulative variance in both symptoms of physical strain when placed in the presence of significant hardiness, OSI common stressor, coping and personal meaning predictors of strain. As the tables show, although rather low, the incremental effect of the personal desirability of role-ambiguity stressors adds a significant 1.55% (1.31% adj) to the cumulative variance in physical strain explained by the model.

Therefore, given this result, there is support for both the theoretical importance and relative effect of the personal desirability of common stressors in the transactional view of stress. As such, it serves to highlight the functional importance of personal desirability appraisal processes in the mental summation of the cognitive imbalance between actual (i.e., recognition of stressors) and ideal (i.e., personal desirability of stressors) stressors and the translation of stress to symptoms of strain. Furthermore, there is support for the hypothesis (H2) that the personal desirability of common study stressors would explain a significant percentage of the cumulative variance when placed in the presence of significant dispositional, common stressor, coping strategy and personal meaning predictors of strain.

Table G.13
Hierarchical Regression: Physical Strain on Hardiness, OSI Common Stressor, Expectancy Psychological Stress and Personal Desirability

Model	Equation	Rsqr	Rsqr (adj)	Rsqr Ch	Sig F Ch	Beta	95% CI For B	T	Sig T
	Step 1								
	Commitment	23.94%	23.18%	23.94%	.0000	-0.3208	-1.184 - -0.405	-4.025	.0001
Hardiness	Control					-0.2181	-1.082 - -0.176	-2.737	.0068
Mult R=.4892; SE 18.8358; F(2,201) 31.6250; p. 0000									
	Step 2								
Stressors	OSI Composite	35.38%	34.41%	11.44%	.0000	0.3493	0.136 - 0.270	5.950	.0000
Mult R=.5948; SE 17.4050; F(3,200) 36.4944; p. 0000									
	Step 3								
Coping	Physical#	38.21%	36.97%	2.83%	.0029	-0.1823	-7.399 - -1.553	-3.020	.0029
Mult R=.6181; SE 17.0621; F(4,199) 30.7618; p. 0000									
	Step 4								
Expectancy	Exp Psyc Stress#	44.73%	43.33%	6.52%	.0000	-0.2864	-10.580 - -4.447	-4.832	.0000
Mult R=.6688; SE 16.1778; F(5,198) 32.0431; p. 0000									
	Step 5								
Desirability	Role-Ambiguity#	46.28%	44.64%	1.55%	.0181	0.1340	0.9265 - 9.821	2.383	.0181
Mult R=.6803; SE 15.9900; F(6,197) 28.2799; p. 0000									

Note: #Transformed Variable

G.2.4 "Like More" "About Right" and "Like Less" Response Anchor Analyses

These analyses sought to further unpack the nature and effect of the Personal Desirability assigned to common study stressors. As Tables G.14 and G.15 show, the appraisal of common study stressors in terms of "like More" (i.e., desirable) "About Right" (i.e., congruence) and "Like Less" (i.e., undesirable) each explain a significant percentage of the variance in physical, psychological and composite symptoms of strain.

Physical Strain

When appraised in terms of "Like More" of the common study stressor (i.e., the person's desire for more of the stressor), the desire for more role-ambiguity stressors ex-

plains a moderate 11.04 (10.60% adj) of the variance in physical strain. Similarly, when the desirability of common stressors is appraised as "About Right" (i.e., personal satisfaction with the stressor) for the person, the personal satisfaction with role-insufficiency and role-ambiguity stressors explains a slightly higher 13.44% (12.59% adj) of the variance in symptoms of physical strain. However, in contrast to the results for "Like More" and "About Right" desirability of stressors, when common stressors are appraised as "Like Less" of the stressor (i.e., their desire for less of the stressor), the desire for less role-boundary stressors explains a substantially lower but nonetheless significant 3.73% (3.25% adj) of the variance in symptoms of physical strain.

Table G.14
Backward Regression: Physical Strain on Personal Desirability for "Like More" "About Right" and "Like Less" of Common Study Stressors

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
"Like More"	Role-Ambiguity	11.04%	10.60%	0.3323	5.018	.0000
Mult R=.3322; SE 20.3901; F(1,203) 25.1845; p .0000						
"About Right"	Role-Insufficiency#	13.44%	12.59%	-0.2273	-3.141	.0019
	Role-Ambiguity#			-0.2067	-2.857	.0047
Mult R=.3666; SE 20.1624; F(2,202) 15.6845; p .0000						
"Like Less"+	Role-Boundary#	3.73%	3.25%	0.1931	2.803	.0055
Mult R=.1931; SE 21.2113; F(1,203) 7.8581 p .0055						

Note: Pout, ≥ 0.051; # Transformed Variable; "Like Less"+ - Due Significant Skewness, the Role-Ambiguity and Insufficiency Scales Were Removed From the Model (See Tables 4.5.4 & 4.5.5).

Psychological Strain

The personal desirability of common study stressors in terms of "Like More" "About Right" and "Like Less" each explain a significant percentage of the variance in symptoms of psychological strain. As Table G.15 shows, when common study stressors are

appraised in terms of "Like More" of the stressor, the personal desire for more role-ambiguity stressors explains a low 7.42% (7.00% adj) of the variance in symptoms of psychological strain. When common stressors are appraised as "About Right" for the person, the personal satisfaction with role-insufficiency and role-ambiguity stressors explains a higher 9.89% (9.00% adj) of the variance in psychological strain. However, when common study stressors are appraised as "Like Less" of the stressor, the desire for less role-responsibility stressors accounts for a substantially lower 5.33% (4.87% adj) of the variability in symptoms of psychological strain.

Table G.15
Backward Regression: Psychological Strain on Personal Desirability for "Like More" "About right" and "Like Less" of Common Study Stressors

Model	Final Equation	Rsq	Rsq(Adj)	Beta	T	Sig T
"Like More"	Role-Ambiguity	7.42%	7.00%	0.2725	4.034	.0001
Mult R= .2725; SE 12.1024; F(1,203) 16.2767; p .0001						
"About Right"	Role-Insufficiency#	9.89%	9.00%	-0.2087	-3.004	.0030
	Role-Overload			-0.1847	-2.659	.0085
Mult R=.3145; SE 11.9695; F(2,202) 11.0863; p .0000						
"Like Less"+	Role-Responsibility#	5.33%	4.87%	-0.2310	-3.382	.0009
Mult R=.2310; SE 12.2382; F(1,203) 11.4377; p .0009						

Note: Pout, ≥ 0.051; # Transformed Variable; "Like Less"+ - Due Significant Skewness, the Role-Ambiguity and Role-Insufficiency Scales Were Removed From Model (See Tables 4.5.4 & 4.5.5).

Summary of Results

Taken together, the results indicate that the relationship between the desirability of common study stressors in terms of "Like More" "About Right" and "Like Less" and strain is relatively consistent across the dimensions of strain. Furthermore, due to the commonality of the predictors across the "Like More" and "About Right" models, there

is evidence of an overlap in the appraisal of "like More" and "About Right" with stressors. This suggests that (a) these dimensions of appraisal may in effect reduce to a common dimension of person desirability (i.e., personal underload), or alternatively (b) that more discrete scores for "Like More" and "About Right" with a stressor (i.e., the use of scores greater than zero) are required to discriminate the personal desirability assigned to stressors. However, although the results suggest an overlap in the appraisal of common study stressors, the Beta coefficients for the "Like More" and "About Right" models are reversed. This suggests that (a) these domains of appraisal are relatively discrete and (b) have unique or direct relationships with symptoms of strain.

Nonetheless, on the basis of these results, there is support for the hypothesis (H3) that the appraisal (i.e., personal desirability assigned to stressors) of common study stressors in terms of (a) desirable, (b) undesirable and (c) congruence (i.e., balance) would each explain a significant percentage of the variability in symptoms of strain.

G.3 The Correspondence Between the Personal Desirability of Common Stressors and Dimensions of Strain

Due to the finding that "Like More" "About Right" and "Like Less" appraisals of personal desirability each explain a significant percentage of the variance in strain, it is likely that the corresponding mean strain scores for physical and psychological strain will vary in sympathy with the meaning assigned to the stressor (see results studies five and six). Therefore, based on the transactional tenet that the appraisal of an imbalance with a stressor (i.e., "Like More" or "Like Less" of the stressor) may subsequently reflect in symptoms of strain, it is reasonable to hypothesise that the corresponding mean scores for strain will be significantly higher than the corresponding "About Right" mean scores for strain. Furthermore, it is likely that increases in the magnitude of the appraised imbalance between actual and ideal demands (i.e., increases in "Like More or

"Like Less" of the stressor) will correspond to an increase in symptoms of strain. Conversely, for increases in the personal satisfaction assigned to a stressor (i.e., "About Right"), it is reasonable to postulate that increases in the personal satisfaction with work stressors will reflect as a reduction in symptoms of strain.

Figures G.1 to G.4 illustrate the correspondence between increases in the magnitude of scores for (a) the Composite Personal Desirability scale and (b) the Role-Responsibility Personal Desirability scale and mean scores for physical and psychological strain. In addition, Tables G.16 and G.17 show the results from correlated samples T Tests which compared the mean scores for physical and psychological strain corresponding to increases in the magnitude of the scores for the "Like More" "About Right" and "Like Less" Composite Personal Desirability and Role-Responsibility Personal Desirability scales.[G2]

Figures G.1 to G.4 further illustrate the linkage between the appraisal of common study stressors and symptoms of strain. As the graphs show, increases in the mean scores for "Like More" and "Like Less" of common study stressors, generally correspond to higher levels of physical and psychological strain. Conversely, increases in scores for "About Right" with common study stressors (i.e., increases in personal satisfaction), correspond to a noticeable decline in symptoms of physical and psychological strain.

[G2] Note: The Role-Responsibility Personal Desirability scale was chosen as the basis for the mean strain score comparisons of as it had the more normal distribution of responses to the "Like More" "Like Less" and "About Right" response anchors of the scale (see Table G.4).

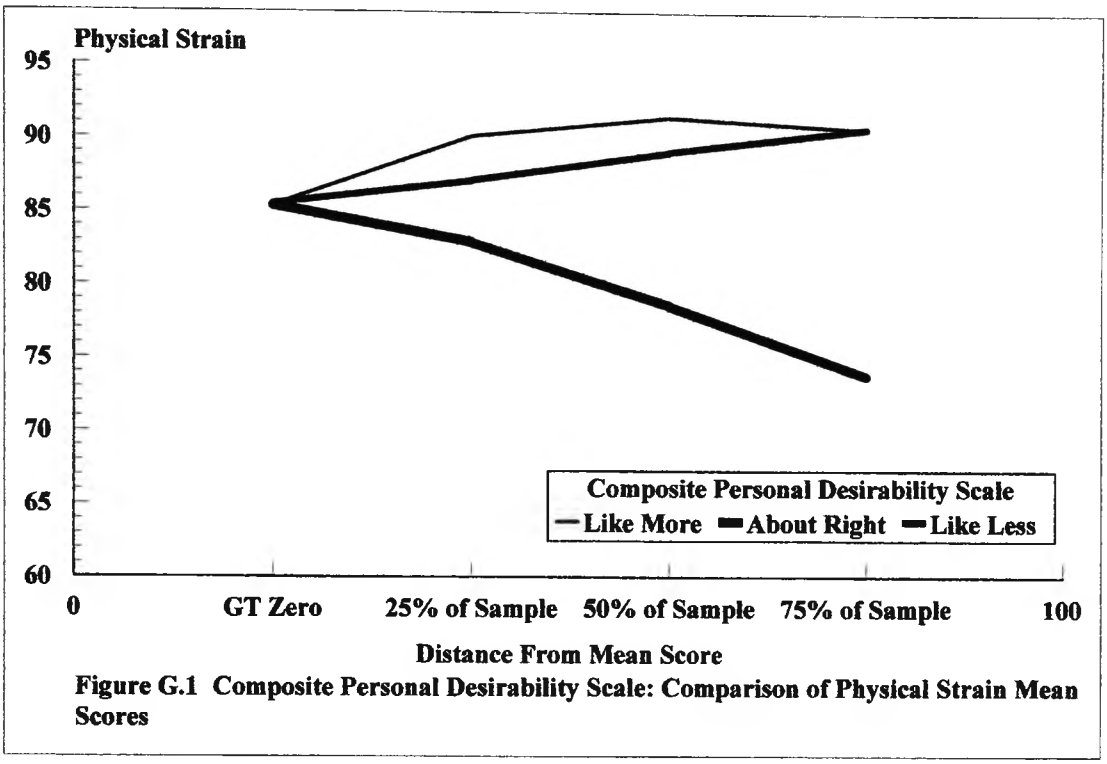


Figure G.1 Composite Personal Desirability Scale: Comparison of Physical Strain Mean Scores

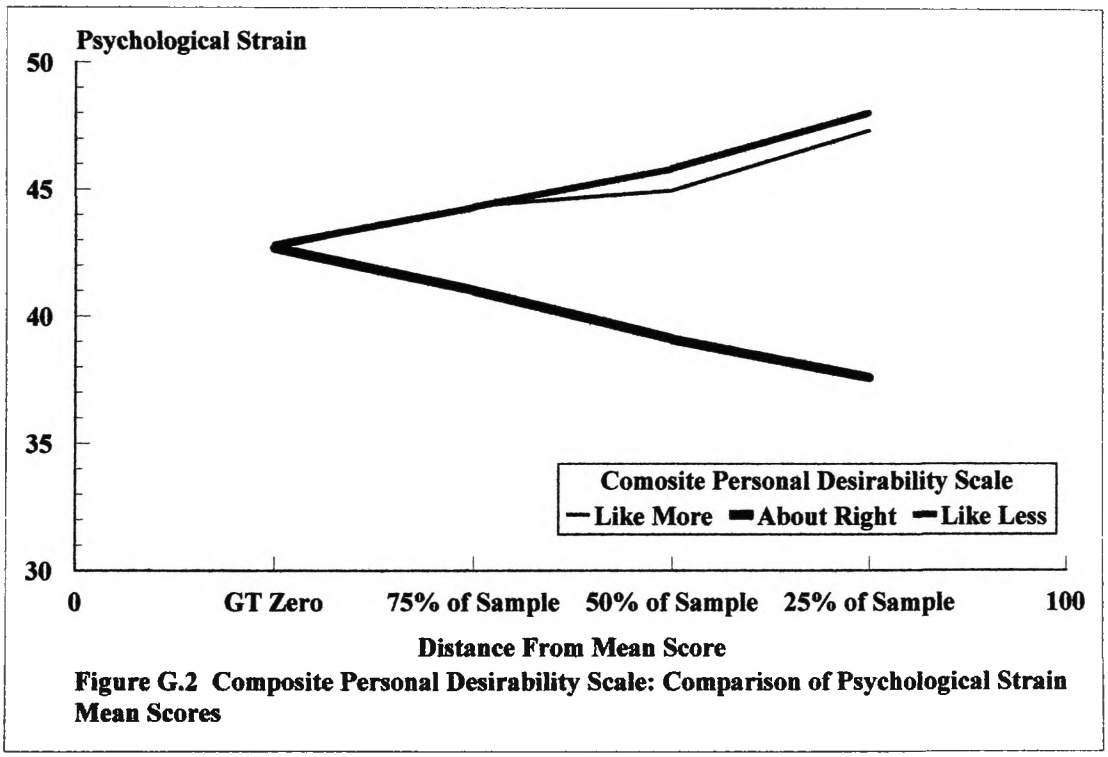


Figure G.2 Composite Personal Desirability Scale: Comparison of Psychological Strain Mean Scores

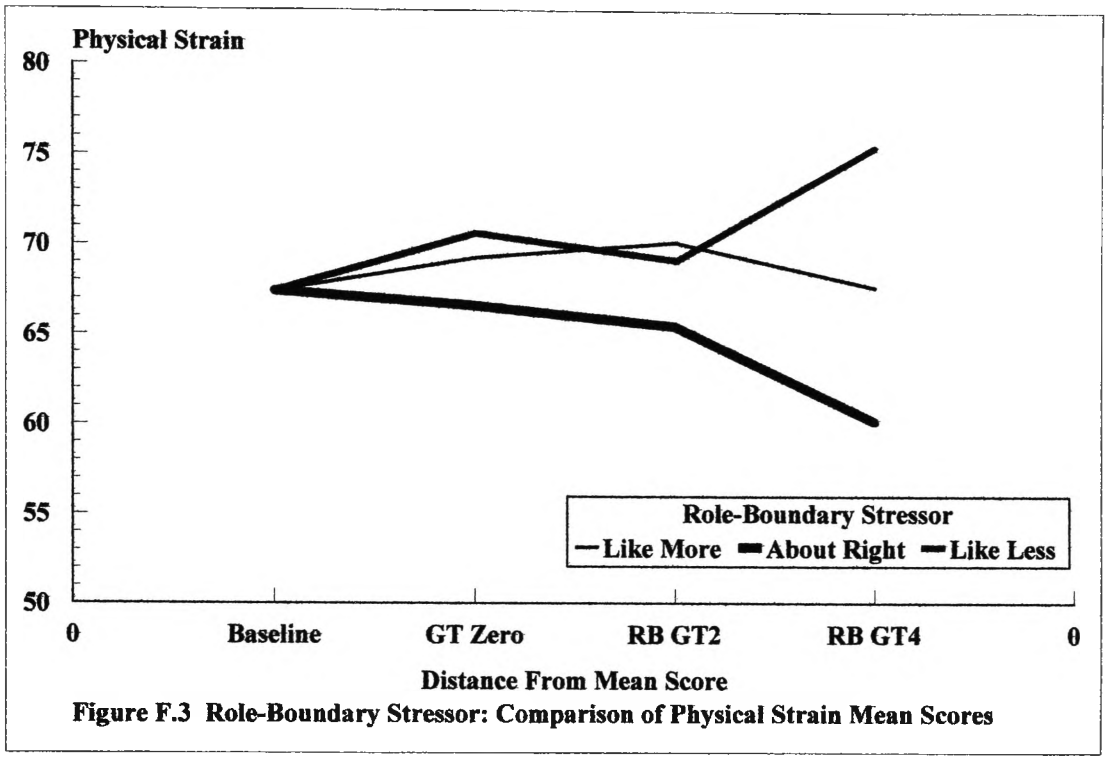


Figure F.3 Role-Boundary Stressor: Comparison of Physical Strain Mean Scores

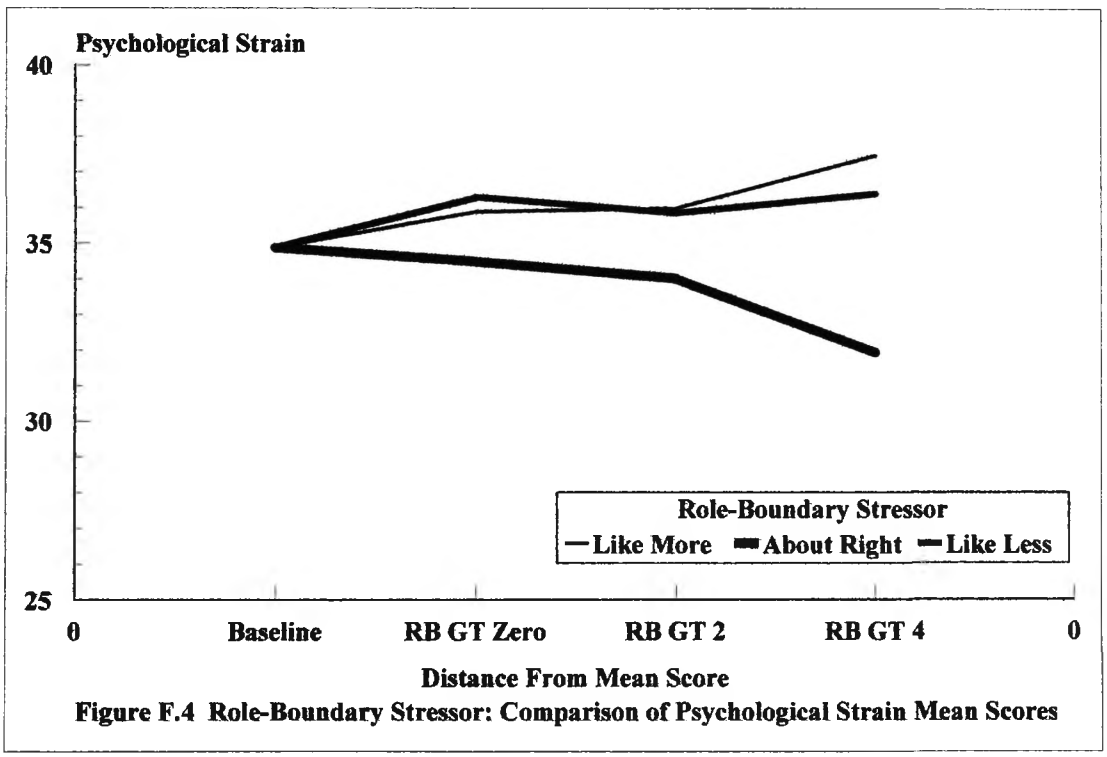


Figure F.4 Role-Boundary Stressor: Comparison of Psychological Strain Mean Scores

Tables G.16 and G.17 show the results from correlated T Tests which test the significance of the mean differences between mean strain scores corresponding to mean scores for the "Like More" "About Right" and "Like Less" scales.[G3] Results for the Composite Personal Desirability scale indicate the presence of significant differences between mean scores for physical and psychological strain corresponding to mean scores for (a) "Like More" and "About Right" and (b) the "Like less" and "About Right" Personal Desirability scales.[G4]

However, from the comparison of mean scores for physical and psychological strain related to the personal desirability of role-responsibility stressors, only two of the comparisons for physical strain and two for psychological strain are significant (i.e., at corrected $\alpha \leq 0.008$). As evident from the results for the 50% samples, with the exception of the difference between mean scores for psychological strain corresponding to "Like Less" and "About Right" with role-responsibility stressors, differences between the mean strain scores for both physical and psychological strain are not significant. Conversely, from the comparisons related to the 25% samples, with the exception of the difference between mean scores for psychological strain corresponding to the "Like More" and "About Right" scales, there are significant differences between mean strain scores for physical and psychological strain corresponding to mean scores for "Like More" and "About Right" with Role-Responsibility stressors; and similarly, those for "Like Less" and "About Right" with Role-Responsibility stressors.

[G3] See Footnote 8, Chapter 4.3.4.5 re discussion on the comparison of correlated samples with missing values. See also Howell, 1992, p. 177.

[G4] Note: Due to multiple comparisons (6) and thereby familywise errors, the significance of T* for each T Test is adjusted from $\alpha = 0.05$ to 0.008 (i.e., $\alpha' = 0.05/6$).

Table G.16
Statistical Comparison of Physical Strain Mean Scores Corresponding to "Like More" "Like Less" and "About Right" Evaluative Scores

Evaluative Scale	No Cases Retained	Missing Values	Random Sample	Scale Mean	SE of Mean Diff	T	Signif T*
Personal Desirability Composite Scale							
Sample Size ≈ 50% of Sample							
Like More	203	109	94	92.60	2.103	-6.44	.000
About Right	203	108	94	79.06	----	----	----
Like Less	203	110	94	87.50	1.967	-4.29	.000
About Right	203	108	94	79.06	----	----	----
Sample Size ≈ 25% of Sample							
Like More	110	68	42	47.53	2.972	-5.38	.000
About Right	110	68	42	39.21	----	----	----
Like Less	110	70	42	47.45	2.950	-5.05	.000
About Right	110	68	42	39.21	----	----	----
Role-Responsibility Common Study Stressor							
Sample Size ≈ 50% of Sample							
Like More	196	115	79	87.47	1.651	.2.26	.027
About Right	196	118	79	83.74	---	----	----
Like Less	196	126	79	87.78	1.649	-2.45	.017
About Right	196	118	79	83.74	----	----	----
Sample Size ≈ 25% of Sample							
Like More	110	71	38	42.58	2.327	-5.29	.000
About Right	110	73	38	40.57	----	----	---
Like Less	110	72	38	47.60	3.117	-3.31	.002
About Right	110	73	38	40.57	----	----	----

Note: For Each Block of Comparisons (i.e., Each Random Sample), Required α for Signif T* Adjusted From 0.05 to 0.008 (i.e., $\alpha/c = 0.05/6 = 0.008$)

Table G.17
Statistical Comparison of Psychological Strain Mean Scores Corresponding to "Like More" "Like Less" and "About Right" Evaluative Scores

Evaluative Scale	No Cases Retained	Missing Values	Random Sample	Scale Mean	SE of Mean Diff	T	Signif T*
Personal Desirability Composite Scale							
Sample Size ≈ 50% of Sample							
Like More	203	109	94	45.12	1.132	-5.79	.000
About Right	203	108	94	38.57	----	----	----
Like Less	203	110	94	44.88	1.066	-5.92	.000
About Right	203	108	94	38.57	----	----	----
Sample Size ≈ 25% of Sample							
Like More	110	68	42	47.53	2.051	-4.01	.000
About Right	110	68	42	39.21	----	----	----
Like Less	110	70	42	47.45	2.141	-3.88	.000
About Right	110	68	42	39.21		----	
Role-Responsibility Common Study Stressor							
Sample Size ≈ 50% of Sample							
Like More	196	115	79	41.97	1.053	-0.34	.736
About Right	196	118	79	41.62	----	----	----
Like Less	196	126	79	46.03	1.109	-3.98	.000
About Right	196	118	79	41.62	----	----	----
Sample Size ≈ 25% of Sample							
Like More	110	71	38	42.58	1.706	-1.17	.248
About Right	110	73	38	40.57	----	----	----
Like Less	110	72	38	47.60	1.909	-3.68	.001
About Right	110	73	38	40.57	----	----	----

Note: For Each Block of Comparisons (i.e., Each Random Sample), Required α for Signif T* Adjusted From 0.05 to 0.008 (i.e., $\alpha/c = .05/6 = 0.008$)

Thus, based on the trend of the graphical data, there is descriptive support for the hypothesis (H4) that increases in the appraisal of a common study stressor as either more desirable or more undesirable corresponds to an increase in symptoms of strain; and increases in the appraisal of congruence (i.e., satisfaction) with common study stressors, to a decrease in symptoms of strain. Furthermore, on the basis of the graphical data and the evidence of significant T Tests, there is support for the hypothesis (H5) that mean strain scores corresponding to the appraisal of common study stressors as either desirable or undesirable will be significantly higher than mean strain scores corresponding to the appraisal of congruence or personal satisfaction with common study stressors.

G.4 Strain Scale Evaluations

Table G.18 presents a summary of the variance explained by models using measures of physical, psychological and composite strain to capture the translation of stress to symptoms of strain. That is, they indicate how well the measure of strain is able to tap the nature of the personal outcome from the underlying transactional process.

As the Table indicates, for each of the regression models, the 27 item measure of Composite Strain is generally the more effective (but not the most parsimonious) measure of the strain related outcome from the transactional relationship with sources of stress. On average, across the models, it accounts for 22.865% (adj) of the variance in symptoms of strain; in comparison, the 10 item Psychological Strain scale, accounts for a lower 18.396% of the explained variance; and the 20 item Physical Strain scale, on average a higher 20.219% (adj) of the explained variance. Thus, in proportional terms, the measure of Composite Strain on average accounts for 24.29% more of the explained

Table G.18
Strain Scale Evaluation: Comparison of Physical, Psychological and Composite Strain Dimensions of Personal Strain

Regression Model	Dimension of Strain: Physical		Psychological		Composite Strain	
	Final Solution	Rsqr Adj	Final Solution	Rsqr Adj	Final Solution	Rsqr (adj)
OSI Stressor	Intrinsic To Job Home/Work	21.57%	Home/Work Intrinsic To Job	20.53%	Intrinsic To Job Home/Work	23.68%
OSI Composite	OSI Composite	20.41%	OSI Composite	15.88%	OSI Composite	21.72%
Personal Desirability	Desir R-Ambig# Desir R-Insuffic#	10.07%	Desir R-Boundary# Desir R-Ambig#	7.60%	Desir R-Ambig#	9.47%
OSI Composite & Person Meaning	Exp Psyc Stress# OSI Composite Desir R-Ambig#	31.97%	Exp Psyc Stress# OSI Composite Desir R-Ambig#	28.62%	Exp Psyc Stress# OSI Composite Belief Soc Support	37.84%
Coping	Physical# Recreational Rational/Cognitive	20.20%	Recreational Rational/Cognitive Social Support#	23.57%	Recreational Rational/Cognitive Physical#	24.01%
Hardiness	Commitment Control Challenge	26.89%	Commitment Challenge	24.97%	Challenge Commitment Control	31.47%
Best Fit	Exp Psyc Stress# OSI Composite Control Commitment Desir R-Ambig# Physical Coping#	44.64%	Commitment Exp Psyc Stress# Recreational Coping Belief Soc Support Challenge	41.95%	Exp Psyc Stress# Commitment Belief Soc Support Desir R-Ambig# OSI Composite Physical Coping# Control	51.69%
Like More	Desir R-Ambig	10.60%	Desir R-Ambig	6.97%	Desir R-Ambig	11.25%
About Right	Desir R-Insuffic# Desir R-Ambig#	12.59%	Desir R-Insuffic# Desir R-Overload	9.00%	Desir R-Ambig# Desir R-Insuffic#	13.30%
Like Less	Des R-Boundary#	3.25%	Desir R-Respons#	4.87%	Des R-Boundary#	4.22%

Note: 1) Final Solution: (a) Prob of t Value ≤ 0.051; (b) Shown in Order of Significance; (c) # Transformed Scale; 2) Variables in Model: (a) OSI stressor, Personal Desirability, Coping and Hardiness Scales - See Table 3.3.5.13; b) OSI Composite/Personal Meaning - See Table 3.3.5.16; "Best Fit" - see Table 3.3.5.18; "Like More" "About Right" and "Like Less" Models - See Tables 3.3.5.25, G.14 & G.15.

variance (i.e., an additional 4.469%) than that attributed to psychological symptoms of strain and 13.09% (i.e., an additional 2.65%) more than that attributed to physical strain.

When seen in terms of parsimony, however, the 10 item Psychological Strain scale is the more efficient and specific measure of strain. On average, each variable in the scale accounts for 1.840% of the variance explained by the model; those in the 20 item Physical Strain scale, a substantially lower 1.011% of the variance; and those in the 27 item Composite Strain scale, a somewhat lower 0.847% of the variance explained by the model. However, when seen in terms of general utility, the multidimensional Composite Strain scale has the greater utility and versatility. On average, it accounts for the highest percentage of strain; and furthermore, is designed to tap facets of both physical and psychological strain. In addition, these facets of strain may be extracted from the scale if there is a need to further explore the transactional relationship between stressors and more specific types of strain. Therefore, the Composite Strain scale may be seen as the preferred approach for the measurement of Physical and Psychological symptoms of strain

G.5 Independence of Specific and General Appraisal Processes

The results from hierarchical modelling (see Table 3.3.5.19) indicate that personal mean-ing dimensions of appraisal account for 73.78% of the variance explained by the model. To further explore this finding, a factor analysis of the personal meaning scales was used to confirm the independence of specific and general dimensions of appraisal. As the results in Table G.19 show, the factor solution with varimax rotation identified two independent factors which account for 60.10% of the variance in the model. The more general dimensions of hardiness load on the first factor; and specific dimensions

of appraisal on the second factor. A subsequent factor analysis of the 15 items in the three scales loading on factor two was used to confirm the item structure and show support for the conceptual independence of these scales. That is, the factor solution was found to replicate the structural nature of the respective scales.

Table G.19
Factor Analysis - Principal Components Extraction: Specific and General Dimensions of Appraisal

Varimax Rotation	Factor Matrix Loadings*	
Scales	**Factor 1**	**Factor 2**
Hard Control	.8937	
Hard Commitment	.8925	
Pers Desir Role-Ambig		.7059
Expect Psyc Stress		-.6646
Belief Social Support		.6289
Eigen Values	1.8788	1.1274
Cumulative Variance	37.60	60.10

Note: n = 205; *Factor loadings 0.3 or greater shown; KMO = 0.5742; Bartlett Test of Sphericity = 1357930, p .0000; Reproduced Correlations Residuals - 6(60.00%) > 0.05.

Appendix G.6

Stress at University Survey

University of Wollongong
Department of Psychology

Stress at University Survey

Researcher: Tom Abson - Lecturer/PhD Student

Welcome to the stress at university survey. My name is Tom Abson and I'm a Lecturer/PhD student in the Department of Psychology. I would like your help to investigate the nature of stress associated with your studies at this university.

The objective of my research is to identify the areas of your studies which you feel are stressful and the relationship of these stressful areas with your current feeling of well-being.

If you would like to participate in this research, please indicate in the space below. The questionnaires should take no longer than 45 minutes to complete. **There is no need to provide your name or any form of identification on the questionnaire.** Any information you provide in the questionnaires is strictly confidential and will be destroyed at the conclusion of my research.

Should you have any further questions concerning the questionnaire please contact me in the Dept. of Psychology (Room 41.139B; Phone 214511) or at home (02) 95243322.

Note:

1. You are under no obligation to complete the questionnaire and therefore free to withdraw from the study at any time.
2. Any complaints regarding the conduct of this research should be directed to the secretary of the University of Wollongong Human Experimentation Ethics Committee - Phone:(042) 213079.

Would Like To Participate ☐ (please tick)

Thanking you for your contribution to this research

Tom Abson
Dept. of Psychology.

Dealing with stress at University
A useful contact service is the
student counselling service in
the student centre.
Phone: (042) 213445 or (042) 213446

Note: Please do not write your name on the questionnaire

Appendix G.6.1

Study Demands Valence Scale

Please read before answering the questions

Study Demands Valence Scale

Each of us knows that there are aspects of our studies that we feel are either good or bad for us and therefore influence our performance at university.

We do not want to know whether your studies have the following features or not. **Rather, we want to know how you feel about these study features** - whether you think they are good or bad for you and your studies at university.

Now please read each item and then circle or cross the number which best represents your answer using the eight point scale:

Most Definitely Good +4	Normally Good +3	Sometimes Good +2	Neither Good or Bad +1 -1	Sometimes Bad -2	Normally Bad -3	Most Definitely Bad -4

Q1	Study demands which exceed my personal resources and the resources available at the university are:	**Good**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Bad**
Q2	Being unable to accomplish the study load expected of me is:	**Good**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Bad**
Q3	Being uncertain of what is expected of me at university is:	**Good**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Bad**
Q4	Having no clear sense of what is needed in order to achieve my personal goals at university (e.g., high grades for my assignments/coursework) is:	**Good**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Bad**
Q5	Lectures and tutors with conflicting ideas about what is required from my study is:	**Good**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Bad**
Q6	Conflicting loyalties at university (i.e., between friends groups or academic staff) are:	**Good**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Bad**
Q7	A poor fit between my education, intellectual ability and my course of study at university is:	**Good**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Bad**
Q8	A course of study that does not recognise or take advantage of my previous educational training or work experience is:	**Good**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Bad**
Q9	Being responsible for the study/work performance of other students or people outside the University is:	**Good**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Bad**
Q10	Being responsible for the welfare of others at university or people outside the university is:	**Good**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Bad**
Q11	Irregular and sometimes long hours of study are:	**Good**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Bad**
Q12	Exposure to extreme and/or changing environmental conditions such as noise, heat and lighting when at university or studying at home is:	**Good**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Bad**

Appendix G.6.2

Biographical data

Some Questions About You

We need To Know Some Details About You:

Your Age	_____	Years
Sex	_____	Male or Female
Student	_____	Full Time
	_____	Part Time
Work	_____	Full Time
	_____	Part Time
	_____	Not Working
Your Course of Study	_____	
Years Enrolled	_____	Years
Average for all your Coursework	_____	% (approx)

Appendix G.6.3

Sources of Pressure in Your Study

Sources of Pressure in Your Study

Almost anything can be a source of pressure (to someone) at a given time, and individual's perceive potential sources of pressure differently. The person who says they are 'under a tremendous amount of pressure at university at the moment' usually means that they have too much coursework to do. But this is only half the picture.

The items below are all potential sources of pressure at university. You are required to rate them in terms of the **degree of pressure each may place on you**. Please answer by circling the number of your answer against the scale shown:

Very definitely is a source - 6
Definitely is a source - 5
Generally a source - 4
Generally is not a source - 3
Definitely is not a source - 2
Very definitely is not a source - 1

1	Having far too much study to do	**6**	**5**	**4**	**3**	**2**	**1**
2	Lack of power and influence at university	**6**	**5**	**4**	**3**	**2**	**1**
3	Overextended - being expected to do coursework beyond my level of ability	**6**	**5**	**4**	**3**	**2**	**1**
4	Not having enough study to do	**6**	**5**	**4**	**3**	**2**	**1**
5	Managing or supervising the study/coursework of other people	**6**	**5**	**4**	**3**	**2**	**1**
6	Coping with university politics	**6**	**5**	**4**	**3**	**2**	**1**
7	Taking my study/coursework home	**6**	**5**	**4**	**3**	**2**	**1**
8	Lack of pay while at university (including perks and fringe benefits)	**6**	**5**	**4**	**3**	**2**	**1**
9	Personal beliefs conflicting with those of the university	**6**	**5**	**4**	**3**	**2**	**1**
10	Underutilisation - working at a level below my level of ability	**6**	**5**	**4**	**3**	**2**	**1**
11	Inadequate guidance and backup support from lecturers and tutors	**6**	**5**	**4**	**3**	**2**	**1**
12	Lack of consultation and communication with lecturers and tutors	**6**	**5**	**4**	**3**	**2**	**1**
13	Not being able to 'switch off' at home	**6**	**5**	**4**	**3**	**2**	**1**
14	Keeping up with new techniques, ideas, technology or innovations or new challenges associated with my course of study	**6**	**5**	**4**	**3**	**2**	**1**
15	Ambiguity in the nature of the student role at university	**6**	**5**	**4**	**3**	**2**	**1**
16	Inadequate or poor quality of practical training/personal development in coursework	**6**	**5**	**4**	**3**	**2**	**1**

Sources of pressure in your study (continued)

Very definitely is a source - 6
Definitely is a source - 5
Generally a source - 4
Generally is not a source - 3
Definitely is not a source - 2
Very definitely is not a source - 1

17	Attending lectures and tutorials	6	5	4	3	2	1
18	Lack of social support by people at university	6	5	4	3	2	1
19	My spouses/partner's/family's attitude toward my study and career	6	5	4	3	2	1
20	Having to study very long hours	6	5	4	3	2	1
21	Conflicting tasks and study demands in my course of study	6	5	4	3	2	1
22	Covert discrimination and favouritism	6	5	4	3	2	1
23	Mundane study tasks or 'paperwork'	6	5	4	3	2	1
24	Inability to delegate routine aspects of my study/coursework	6	5	4	3	2	1
25	Threat of impending failure or removal from a course of study	6	5	4	3	2	1
26	Feeling isolated	6	5	4	3	2	1
27	A lack of encouragement from lecturers and/or tutors	6	5	4	3	2	1
28	Academic staff shortages and unsettling changes in lecturers and tutors	6	5	4	3	2	1
29	Demands my study makes on my spouse/partner and family members	6	5	4	3	2	1
30	Being undervalued	6	5	4	3	2	1
31	Having to take risks with my assignments	6	5	4	3	2	1
32	Changing courses of study every semester in your degree programme	6	5	4	3	2	1
33	Too much or too little variety in your course of study	6	5	4	3	2	1
34	Attending lectures/tutorials or studying with those of the opposite sex	6	5	4	3	2	1
35	Inadequate feedback from lecturers/tutors about my performance	6	5	4	3	2	1
36	Living away from home and having to live in residentials or rented accommodation	6	5	4	3	2	1
37	Misuse of time by other people (i.e., time related factors that effect your study at home or university)	6	5	4	3	2	1
38	Simply being seen as a student	6	5	4	3	2	1
39	Unclear prospects for high grades	6	5	4	3	2	1

Sources of pressure in your study (continued)

Very definitely is a source - 6
Definitely is a source - 5
Generally a source - 4
Generally is not a source - 3
Definitely is not a source - 2
Very definitely is not a source - 1

40	The accumulative effects of minor study tasks	6	5	4	3	2	1
41	Absence of emotional support from others outside the university	6	5	4	3	2	1
42	Insufficient finance or resources for my needs at university	6	5	4	3	2	1
43	Demands that study makes on my private/social life	6	5	4	3	2	1
44	Changes in the way you are asked to present material or do your assignments	6	5	4	3	2	1
45	Simply being 'visible' or 'available' to others at university	6	5	4	3	2	1
46	Lack of practical support from others outside university	6	5	4	3	2	1
47	Factors not under your direct control	6	5	4	3	2	1
48	Sharing of study tasks and responsibility evenly (e.g., shared seminar presentations)	6	5	4	3	2	1
49	Homelife with a partner who is also pursuing a career	6	5	4	3	2	1
50	Dealing with ambiguous or 'delicate' situations	6	5	4	3	2	1
51	Having to adopt a negative role (such as refusing to help someone with an assignment)	6	5	4	3	2	1
52	An absence of any potential career opportunities or advancement	6	5	4	3	2	1
53	Morale of students and climate (i.e., mood) at university	6	5	4	3	2	1
54	Attaining your own personal levels of performance	6	5	4	3	2	1
55	Making important decisions	6	5	4	3	2	1
56	'Personality' clashes with others	6	5	4	3	2	1
57	Implications of mistakes you make	6	5	4	3	2	1
58	Opportunities for personal development	6	5	4	3	2	1
59	Absence of stability or dependability in home life	6	5	4	3	2	1
60	Pursuing a career at the expense of home life	6	5	4	3	2	1
61	Characteristics of the university's structure and design	6	5	4	3	2	1

Appendix G.6.4

Study Demands Expectancy Scale

Please read before answering the questions

Study Demands Expectancy Scale

Each of us believe that there are aspects of our studies that will cause us stress when either at university or at home. Listed below are a number of questions about study at university. We do not want to know whether these features about study and university cause people stress. **Rather, we want to know how likely you believe each of these features about your studies will or will not cause you stress either at university or at home.**

Please read each question carefully and then circle the number which best represents **what you believe** about the question using the eight point scale:

Most Certainly Likely +4	Certainly Likely +3	Sometimes Likely +2	I'm Not Sure +1 -1	Unlikely -2	Very Unlikely -3	Most Certainly Unlikely -4

Q1	Study demands which exceed my personal resources and the resources available at university will cause me stress:	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Unlikely**
Q2	Being unable to accomplish the study load expected of me will cause me stress:	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Unlikely**
Q3	Being uncertain of what is expected of me at university will cause me stress:	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Unlikely**
Q4	Having no clear sense of what I need to achieve in order to achieve my personal goals at university (e.g. high grades for my assignments/coursework) will cause me stress:	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Unlikely**
Q5	Lecturers and tutors having conflicting ideas about what is required from my study will cause me stress:	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Unlikely**
Q6	Having conflicting loyalties at university will cause me stress (i.e., between friends, groups or academic staff):	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Unlikely**
Q7	A poor fit between my education, intellectual ability and my course of study will cause me stress:	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Unlikely**
Q8	A course of study that does not recognise or take advantage of my previous educational training or work experience will cause me stress:	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Unlikely**
Q9	Being responsible for the performance of other students or people outside the university will cause me stress:	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Unlikely**
Q10	Being responsible for the welfare of others (i.e., either at or outside the university) will cause me stress:	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Unlikely**
Q11	Irregular and sometimes long hours of study will cause me stress:	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Unlikely**
Q12	Exposure to extreme and/or changing environmental conditions such as noise, heat and lighting when at university or studying at home will cause me stress:	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**Unlikely**

Appendix G.6.5

Psychological Strain Scale

Psychological Strain Scale

In this next section we need to know something about **your feelings and mood at the present time** - i.e., over the past week or so. For each question, please circle the positive or negative number which **you feel best describes your current feelings or mood.** Consider your answer to each question using the eight point response scale:

Most of Time		often	Now and Then		Rarely	Mostly Never	
+ 4	+3	+2	+1	-1	-2	-3	-4

		Most of Time							Mostly Never
Q1	Lately, I am easily irritated	+4	+3	+2	+1	-1	-2	-3	-4
Q2	Lately, I have been depressed	+4	+3	+2	+1	-1	-2	-3	-4
Q3	Lately, I have been feeling anxious	+4	+3	+2	+1	-1	-2	-3	-4
Q4	I have been happy lately	+4	+3	+2	+1	-1	-2	-3	-4
Q5	So many thoughts run through my head at night that I have trouble falling asleep.	+4	+3	+2	+1	-1	-2	-3	-4
Q6	Lately, I respond badly in situations that normally wouldn't bother me	+4	+3	+2	+1	-1	-2	-3	-4
Q7	I find myself complaining about little things	+4	+3	+2	+1	-1	-2	-3	-4
Q8	Lately, I have been worrying	+4	+3	+2	+1	-1	-2	-3	-4
Q9	I have a good sense of humour	+4	+3	+2	+1	-1	-2	-3	-4
Q10	Things are going about as they should	+4	+3	+2	+1	-1	-2	-3	-4

Appendix G.6.6

Life Disposition Scale

Life Disposition Scale

Listed below are a number of statements about life which people often feel differently about. Think carefully about each question and how much you feel the statement is **true of you**. Circle your positive or negative response on the scale opposite the question. Consider each question using the eight point response scale:

Very True			Now and Then			Very False	
+4	+3	+2	+1	-1	-2	-3	-4

Q1	Most of my life gets spent doing things that are worthwhile	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q2	Planning ahead can help avoid most future problems	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q3	No matter how hard I try, my efforts usually accomplish nothing	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q4	I don't like to make changes in my everyday schedule	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q5	The "tried and True" ways are always best	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q6	Working hard doesn't matter, since only the lecturers/tutors profit by it	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q7	By working hard you can always achieve your goals	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q8	Most of what happens in life is just meant to be	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q9	When I make plans I'm certain I can make them work	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q10	It's exciting to learn something about myself	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q11	I really look forward to my work	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q12	If I'm working on a difficult task, I know when to seek help	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q13	I won't answer a question until I'm sure I understand it	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q14	I like a lot of variety in my coursework	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q15	Most of the time, people listen carefully to what I say	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**

Life Disposition Scale (continued)

Q16	Thinking of yourself as a free person just leads to frustration	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q17	Trying your best at university really pays off in the end	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q18	My mistakes are usually very difficult to correct	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q19	It bothers me when my daily routine gets interrupted	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q20	Most good athletes and leaders (and students) are born, not made	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q21	I often wake up eager to take up my life wherever it left off	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q22	Lots of times, I really don't know my own mind	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q23	I respect rules because they guide me	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q24	I like it when things are uncertain or unpredictable	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q25	I can't do much to prevent it, if someone wants to harm me	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q26	Changes in routine are interesting to me	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q27	Most days, life is really interesting and exciting for me	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q28	What happens to me tomorrow depends on what I do today	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q29	It's hard to imagine anyone getting excited about studying	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**
Q30	Ordinary course work is just too boring to be worth doing	**Very True +4 +3 +2 +1 -1 -2 -3 -4 Very False**

Appendix G.6.7

Personal Health Scale

Personal Health Scale

(After Osipow, S. H., & Spokane, A. R., 1983; Smith, P., & Bennett, S., 1983)

We also need to know something about your general health. Listed below are a number of common health problems. Please circle the positive or negative number which you feel best indicates how frequently you suffer from each health problem. Record your response to each question using the eight response scale:

Very Often		Often	Now and Then		Seldom	Rarely or Never	
+4	+3	+2	+1	-1	-2	-3	-4

		Very Often						Rarely or Never	
Q1	Stomach upsets	+4	+3	+2	+1	-1	-2	-3	-4
Q2	Unplanned weightgain	+4	+3	+2	+1	-1	-2	-3	-4
Q3	Eyestrain	+4	+3	+2	+1	-1	-2	-3	-4
Q4	Headaches	+4	+3	+2	+1	-1	-2	-3	-4
Q5	Tense/anxious	+4	+3	+2	+1	-1	-2	-3	-4
Q6	Coughing	+4	+3	+2	+1	-1	-2	-3	-4
Q7	Erratic eating	+4	+3	+2	+1	-1	-2	-3	-4
Q8	Tiredness	+4	+3	+2	+1	-1	-2	-3	-4
Q9	Eat Wrong Foods	+4	+3	+2	+1	-1	-2	-3	-4
Q10	Uninterested	+4	+3	+2	+1	-1	-2	-3	-4
Q11	Colds	+4	+3	+2	+1	-1	-2	-3	-4
Q12	Excess Drinking	+4	+3	+2	+1	-1	-2	-3	-4
Q13	Aches/Pains	+4	+3	+2	+1	-1	-2	-3	-4
Q14	Depression	+4	+3	+2	+1	-1	-2	-3	-4
Q15	Appetite (Hungry)	+4	+3	+2	+1	-1	-2	-3	-4
Q16	Indigestion	+4	+3	+2	+1	-1	-2	-3	-4
Q17	Flu	+4	+3	+2	+1	-1	-2	-3	-4
Q18	Loss of Appetite	+4	+3	+2	+1	-1	-2	-3	-4
Q19	Lethargic (Drowsy)	+4	+3	+2	+1	-1	-2	-3	-4
Q20	Falling/staying asleep	+4	+3	+2	+1	-1	-2	-3	-4

Appendix G.6.8

Study Demands Evaluation Scale

Study Demands Evaluation Scale

In this questionnaire we want you to **evaluate** aspects of your study at university. That is, we want you to consider each question and decide if you would like to have more or less of the study feature in your studies at this university. For each question, please circle the positive or negative number which represents the extent to which you would **"like more"** or **"like less"** of the study feature. Evaluate each question using the eight point response scale:

Would Like More			About Right For Me			Would Like Less	
+4	+3	+2	+1	-1	-2	-3	-4

		Would Like More			About Right		Would Like less		
Q1	Assignments to do	+4	+3	+2	+1	-1	-2	-3	-4
Q2	Coursework that makes use of my talents	+4	+3	+2	+1	-1	-2	-3	-4
Q3	Tight time deadlines	+4	+3	+2	+1	-1	-2	-3	-4
Q4	Help to deal with study demands	+4	+3	+2	+1	-1	-2	-3	-4
Q5	The amount of study I'm expected to do	+4	+3	+2	+1	-1	-2	-3	-4
Q6	Responsibility for my coursework	+4	+3	+2	+1	-1	-2	-3	-4
Q7	Coursework that fits my skills and interests	+4	+3	+2	+1	-1	-2	-3	-4
Q8	Progress in my coursework	+4	+3	+2	+1	-1	-2	-3	-4
Q9	Regular study schedule	+4	+3	+2	+1	-1	-2	-3	-4
Q10	Satisfaction of my needs for success and recognition	+4	+3	+2	+1	-1	-2	-3	-4
Q11	Guidance concerning which assignment to start first	+4	+3	+2	+1	-1	-2	-3	-4
Q12	Responsibility for other students or people outside the university	+4	+3	+2	+1	-1	-2	-3	-4
Q13	Information regarding what is acceptable personal behaviour at university (i.e., socially correct behaviour)	+4	+3	+2	+1	-1	-2	-3	-4
Q14	Resources at university - e.g., library, computers etc.	+4	+3	+2	+1	-1	-2	-3	-4
Q15	Information regarding the priorities of my coursework	+4	+3	+2	+1	-1	-2	-3	-4
Q16	Leadership (i.e., either at or outside the university)	+4	+3	+2	+1	-1	-2	-3	-4

Study Demands Evaluation Scale (continued)

		Would Like More			About Right		Would Like less		
Q17	Student factions at university (e.g., fraternal (political or professional groups)	+4	+3	+2	+1	-1	-2	-3	-4
Q18	Shared decision making with my lecturers and tutors	+4	+3	+2	+1	-1	-2	-3	-4
Q19	Lecturers/tutors with conflicting ideas about my studies	+4	+3	+2	+1	-1	-2	-3	-4
Q20	Divided loyalties at university (i.e., between friends, groups and/or academic staff)	+4	+3	+2	+1	-1	-2	-3	-4
Q21	Concern for the problems of other students at university	+4	+3	+2	+1	-1	-2	-3	-4
Q22	Clear directions from lecturers and tutors	+4	+3	+2	+1	-1	-2	-3	-4
Q23	Responsibility for the welfare of others at university or people outside the university	+4	+3	+2	+1	-1	-2	-3	-4
Q24	The number of people telling me how I should study	+4	+3	+2	+1	-1	-2	-3	-4
Q25	Breaks between lectures and tutorials	+4	+3	+2	+1	-1	-2	-3	-4
Q26	Information about where or how to begin a new assignment	+4	+3	+2	+1	-1	-2	-3	-4
Q27	Reliance on other students to contribute ideas or do their assigned task properly	+4	+3	+2	+1	-1	-2	-3	-4
Q28	Erratic or uncertain lecture and tutorial schedules	+4	+3	+2	+1	-1	-2	-3	-4
Q29	Personal isolation (i.e., time alone while at at university)	+4	+3	+2	+1	-1	-2	-3	-4
Q30	Future career prospects from my course	+4	+3	+2	+1	-1	-2	-3	-4

Appendix G.6.9

Personal Resources and Demands Questionnaire

Personal Resources and Demands Questionnaire

In this section we need to find out something about how you cope with the demands of your studies at university. For each question, please circle the number which best describes your present coping behaviour using the response scale:

Most of time	Usually	Often	I'm not sure		Some-times	Seldom	Rarely or Never
+4	+3	+2	+1	-1	-2	-3	-4

		Most of time							Rarely or never
Q1	I get the sleep I need	+4	+3	+2	+1	-1	-2	-3	-4
Q2	I set aside time to do the things I really enjoy	+4	+3	+2	+1	-1	-2	-3	-4
Q3	I am able to do what I want to do in my free time	+4	+3	+2	+1	-1	-2	-3	-4
Q4	I am able to put my job out of my mind when I go home	+4	+3	+2	+1	-1	-2	-3	-4
Q5	I spend a lot of my time in participating activities (e.g. sports, music, painting, woodworking, sewing etc)	+4	+3	+2	+1	-1	-2	-3	-4
Q6	I exercise regularly (at least 20 minutes most days)	+4	+3	+2	+1	-1	-2	-3	-4
Q7	I have techniques to help avoid being distracted	+4	+3	+2	+1	-1	-2	-3	-4
Q8	Once they are set, I am able to stick to my priorities	+4	+3	+2	+1	-1	-2	-3	-4
Q9	Being available to other students to discuss or assist with their study related problems is demanding	+4	+3	+2	+1	-1	-2	-3	-4
Q10	I spend a lot of my free time on hobbies (e.g. collections of various kinds, etc)	+4	+3	+2	+1	-1	-2	-3	-4
Q11	There is at least one sympathetic person with whom I can discuss my concerns	+4	+3	+2	+1	-1	-2	-3	-4
Q12	There is a person with whom I feel really close	+4	+3	+2	+1	-1	-2	-3	-4
Q13	I gain personal benefit from participation in formal social groups (e.g. religious, political, professional organisations etc)	+4	+3	+2	+1	-1	-2	-3	-4

Personal Resources and Demands Questionnaire (continued)

		Most of time							Rarely or never
		+4	+3	+2	+1	-1	-2	-3	-4
Q14	Being available to the one person or special group of people to whom I feel really close is demanding	+4	+3	+2	+1	-1	-2	-3	-4
Q15	There is at least one person important to me who values me	+4	+3	+2	+1	-1	-2	-3	-4
Q16	I feel I have at least one good friend I can count on	+4	+3	+2	+1	-1	-2	-3	-4
Q17	I feel loved	+4	+3	+2	+1	-1	-2	-3	-4
Q18	I avoid eating or drinking things I know are unhealthy (e.g. coffee, tea, cigarettes, etc)	+4	+3	+2	+1	-1	-2	-3	-4
Q19	Helping with tasks around the house or at home is demanding	+4	+3	+2	+1	-1	-2	-3	-4
Q20	I get regular physical checkups	+4	+3	+2	+1	-1	-2	-3	-4
Q21	I have a circle of friends who value me	+4	+3	+2	+1	-1	-2	-3	-4
Q22	I am careful about my diet (e.g., eating regularly, moderately, and with good nutrition in mind)	+4	+3	+2	+1	-1	-2	-3	-4
Q23	I spend a lot of my time in community activities (eg, scouts, government, etc)	+4	+3	+2	+1	-1	-2	-3	-4
Q24	When faced with the need to make a decision, I try to think through the consequences of choices I might make	+4	+3	+2	+1	-1	-2	-3	-4
Q25	Being a member of a circle of friends is demanding	+4	+3	+2	+1	-1	-2	-3	-4
Q26	I try to keep aware of important ways I behave and things I do	+4	+3	+2	+1	-1	-2	-3	-4
Q27	When faced with a problem I use a systematic approach	+4	+3	+2	+1	-1	-2	-3	-4
Q28	Letting others know that I love and care for them is demanding	+4	+3	+2	+1	-1	-2	-3	-4
Q29	I engage in meditation	+4	+3	+2	+1	-1	-2	-3	-4

Appendix G.6.10

Expectancy Psychological Stress Scale

Please read before answering the questions

Expectancy Psychological Stress Scale

This final questionnaire asks something different - we want to know something about you rather than something about your studies at university. In this questionnaire we want to know how **you believe stress effects your performance** at university.

Each of us have **beliefs about our ability** to perform when feeling stressed. Some of us believe that stress has no effect on their performance at university; conversely, others believe that they are unable to perform to their normal ability when feeling stressed.

Please read each question carefully and then circle the number which best represents **what you believe about the effect of stress on your performance at university** using the eight point scale:

Most Certainly Likely +4	Certainly Likely +3	Sometimes Likely +2	I'm Not Sure +1 -1	Unlikely -2	Very Unlikely -3	Most Certainly Unlikely -4

Q1	When I feel irritable, my patience with lecturers/tutors and other students will become shorter	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4** **Unlikely**
Q2	When I feel down or depressed, my study schedule and coursework performance will deteriorate	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4** **Unlikely**
Q3	When I have trouble falling or staying asleep, my coursework and relations with others at university and/or home will suffer the next day.	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4** **Unlikely**
Q4	When I complain a lot, my lecturers/tutors and friends at university will not listen to me	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4** **Unlikely**
Q5	When I am worried, I am not able to concentrate on my studies properly	**Likely**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4** **Unlikely**

End of Questionnaire

Your participation in this research is very much appreciated

Tom Abson

Note: Please return your completed questionnaire to your tutor, my mailbox (adjacent to my office), or direct to my office (room 139B)

References

Abson, H. T. (1993). Descriptive and affective measurement of occupational stress. *Proceedings of the British Psychological Society, 1, August 1993* (Occupational Psychology Conference, Brighton, 4-6 January 1993), 1-17.

Abson, H. T., & Smith, P. (1995). Improving the measurement of perceived work stressors. *Program and Abstracts: Inaugural Australian Industrial & Organisational Psychology Conference, 14-16 July, 1995.* The Australian Psychological Society Limited.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour.* New Jersey: Prentice-Hall Inc.

Aldwin, C. M. (1994). *Stress, coping, and development: An integrative perspective.* New York: The Guilford Press.

Allred, K. D., & Smith, T. W. (1989). The hardy personality: Cognitive and physiological responses to evaluative threat. *Journal of Personality and Social Psychology, 56,* 257- 266.

Anastasi, A. (1982) *Psychological Testing* (5th ed.). New York: MacMillan Publishing Co., Inc.

Anderson, W. J. R., Cooper, C. L., & Willmott, M. (1996). Sources of stress in the National Health Service: A comparison of seven occupational groups. *Work & Stress, 10,* 88-95.

Anshel, M. H., Robertson, M., & Caputi. P. (1997). Sources of acute stress and their appraisals and reappraisals among Australian police as a function of previous experience. *Journal of Occupational and Organizational Psychology, 70,* 337-356.

Antonovsky, A. (1991). The structural sources of salutogenic strengths. In C. L. Cooper & R. Payne (Eds.), *Personality and stress: Individual differences in the stress process* (pp. 67-104). Chichester: John Wiley & Sons.

Appley, M. H., & Trumbull, R. (1986). Development of the stress concept. In M. H. Appley & R. Trumbull (Eds.), *Dynamics of stress: Physiological, psychological and social perspectives* (pp. 3-18). New York: Plenum Press.

Arnold, M. B. (1960). *Emotion and personality* (Vol. 1 & 2). New York: Columbia.

Arnold, M. B. (1967). Stress and emotion. In M. H. Appley & R. Trumbull (Eds.), *Psychological Stress: Issues in Research* (pp. 123-140). New York: Appleton-Century-Crofts.

Arnold, M. B., & Gasson, S. J., J. A. (1968). Feelings and emotions as dynamic factors in personality integration. In M. B. Arnold (Ed.), The nature of emotion: Selected readings (pp. 203-221). Harmondsworth: Penguin Books.

Bailey, J. M., & Bhagat, R. S. (1987). Meaning and measurement of stressors in the work environment: An evaluation. In S. V. Kasl & C. L. Cooper (Eds.), *Stress and health: Issues in Research Methodology* (pp. 207-229). Chichester: John Wiley & Sons.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84,* 191-215.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. New Jersey: Prentice-Hall Inc.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51,* 1173-1182.

Barone, D. F. (1995). Work stress conceived and researched transactionally. In R. Crandall & P. L. Perrewe' (Eds.), *Occupational stress: A handbook* (pp. 29-37). Washington: Taylor & Francis.

Barratt, P. E. H. (1971). *Bases of psychological methods.* Brisbane: John Wiley & Sons.

Bartone, P. T., Ursano, R. J., Wright, K. M., Ingraham, L. H. (1989). The impact of a military air disaster on the health of assistance workers: A prospective study. The Journal of Nervous and Mental Disease, 177, 317-328.

Bartram, R. (1995). The predictive validity of the EPI and 16PF for military flying training. *Journal of Occupational and Organizational Psychology, 68,* 219-236.

Beardslee, W. R. (1989). The role of self-understanding in resilient individuals: The development of a perspective. *American Journal of Orthopsychiatry, 59,* 266-278.

Beck, J. G., Andrasik, F., & Arena, J. G. (1984). Group comparison designs. In A. S. Bellack & M. Hersen (Eds.), *Research methods in clinical psychology* (pp. 100-138). New York: Pergamon Press.

Beehr, T. A., & McGrath, J. E. (1992). Social support, occupational stress and anxiety. *Anxiety, Stress, and Coping, 5,* 7-19.

Beehr, T. A., King, T. A., & King, D. W. (1990). Social support and occupational stress: Talking to supervisors. *Journal of Vocational Behavior, 36,* 61-81.

Benishek, L. A., & Lopez, F. G. (1997). Critical evaluation of hardiness theory: Gender differences, perception of life events, and neuroticism. *Work & Stress, 11,* 33-45.

Benner, P. E. (1984). *Stress and Satisfaction on the Job: Work Meanings and Coping of Mid-Career Men.* New York: Praeger Publications.

Bohle, P. (1997). Does 'hardiness' predict adaptation to shiftwork? *Work & Stress, 11,* 369-376.

Bosma, H., Stansfeld, S. A., & Marmot, M. G. (1998). Job control, personal characteristics, and heart disease. *Journal of Occupational Health Psychology, 3*, 402-409.

Boumans, N. P. G., & Landeweerd, J. A. (1992). The role of social support and coping behaviour in nursing work: Main or buffering effect? *Work & Stress, 6*, 191-202.

Bowerman, W. R. (1988). Causal cognitions and self-evaluations: Implications for stress management. In C. D Spielberger, I. G. Sarason, & P. B. Defares (Eds.), *Stress and anxiety, Volume 11* (pp. 35-48). Washington: Hemisphere Publishing Corporation.

Bradley, J., & Sutherland, V. (1993). Auditing stress among social service employees prior to stress management interventions. *Proceedings of the British Psychological Society, 1, August 1993* (Occupational Psychology Conference, Brighton, 4-6 January 1993).

Brief, A. P., & Atieh, J. M. (1987). Studying job stress: Are we making mountains out of molehills? *Journal of Occupational Behaviour, 8*, 115-126.

Brief, A. P., & George, J. M. (1995). Psychological stress and the workplace: A brief comment on Lazarus' outlook. In R. Crandall & P. L. Perrewe' (Eds.), *Occupational stress: A handbook* (pp. 15-19). Washington: Taylor & Francis.

Brown, D. F., Anshel, M. H., & Brown, J. M. (1993). Effectiveness of an acute stress coping program on motor performance, muscular tension and affect. *The Australian Journal of Science and Medicine in Sport, 25*, 7-16.

Brown, D. F., & Di Milia, L. (1995). Use of robust estimators of missing data in evaluating shiftwork performance. Work & Stress, 9, 360-367.

Brown, D. F., Kirk, A. K., & Stanley, G. V. (1990). Diagnostic and treatment comparisons of patients presenting at psychiatric emergency centres. *Australian Psychologist, 25*, 40-44.

Brown, D. F., Wright, F. A. C., & McMurray, N. E. (1986). Psychological and behavioral factors associated with dental anxiety in children. *Journal of Behavioral Medicine, 9*, 213-218.

Brown, J., Cooper, C., & Kirkcaldy, B. (1996). Occupational stress among senior police officers. *British Journal of Psychology, 87*, 31-41.

Brown, J. S., & Farber, I. E. (1951). Emotions conceptualised as intervening variables—with suggestions toward a theory of frustration. *Psychological Bulletin, 48,* 465- 495.

Bryman, A. (1989). *Research methods and organization studies.* London: Unwin Hyman.

Buck, V. E. (1972). *Working Under Pressure.* London: Staples Press.

Bynner, J. (1988). Factor analysis and the construct indicator relationship. *Human Relations, 41,* 389-405.

Callan, V. J. (1993). Individual and organizational strategies for coping with organizational change. *Work & Stress, 7*, 63-75.

Campbell, J. P., & Pritchard, R. D. (1976). Motivation theory in industrial and organizational psychology. In M. D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 63-130). New York: Chicago: Rand-McNally.

Caplan, R. D. (1983). Person-environment fit: past, present and future. In C. L. Cooper (Ed.), *Stress research: New directions for the 1980s* (pp. 35-78). New York: John Wiley & Sons.

Caplan, R. D. (1987). Person-environment fit theory and organizations: Commensurate dimensions, time perspectives, and mechanisms. *Journal of Vocational Behaviour 31,* 248-267.

Caplan, R. D., Cobb, S., French, J. P. R. Jr., Van Harrison, R., & Pinneau, S. R. Jr. (1975). *Job demands and worker health: Main effects and occupational differences.* Washington, D. C.: U.S. Department of Health, Education, and Welfare (NIOSH).

Carlin, L, & Farnell, L. (1985). The stress audit - an avenue for individual and organisational change. *Work and People, 11*, 21-27.

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56,* 267-283.

Cherry, N. (1978). Stress, anxiety and work: A longitudinal study. *Journal of Occupational Psychology, 51*, 259-270.

Christensen, L. B., & Stoup, C. M. (1986). *Introduction to statistics for the social and behavioral sciences.* Monterey, California: Brooks/Cole.

Clarke, S. (1998). Organizational factors affecting the incident reporting of train drivers. *Work & Stress, 12*, 6-16.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Cohen, J., & Cohen, P. (1975). *Applied multiple regression/correlation analysis for the behavioral sciences.* New Jersey: Lawrence Erlbaum Associates.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.) New Jersey: Lawrence Erlbaum Associates.

Cohen, S. (1986). Cognitive processes as determinants of environmental stress. In C. D. Spielberger & I. G. Sarason (Eds.), *Stress and anxiety: A sourcebook of theory and research, Volume 10* (pp. 65-81). Washington: Hemisphere Publishing Corporation.

Cohen, S., Kessler, R. C., & Underwood Gordon, L. (1995). Strategies for measuring stress in studies of psychiatric and physical disorders. In S. Cohen, R. C. Kessler, & L. Underwood Gordon (Eds.), *Measuring stress: A guide for health and social scientists* (pp. 3-26). New York: Oxford University Press.

Cooper, C. L. (1983). Identifying stressors at work: Recent research developments. *Journal of Psychosomatic Research, 27,* 369-376.

Cooper, C. L., & Bramwell, R. S. (1992). Predictive validity of the strain components of the Occupational Stress Indicator. *Stress Medicine, 8,* 57-60.

Cooper, C. L., & Davidson, M. (1987). Sources of stress at work and their relation to stressors in non-working environments. In R. Kalimo, M. A. El-Batawi & C. L. Cooper (Eds.), *Psychosocial factors at work and their relation to health* (pp. 99-111). Geneva: World Health Organization.

Cooper, C. L., & Marshall, J. (1976). Occupational sources of stress: A review of the literature relating to coronary heart disease and mental ill health. *Journal of Occupational Psychology, 49,* 11-28.

Cooper, C. L., & Marshall, J. (1978). Sources of managerial and white collar stress. In C. L. Cooper & R. Payne (Eds.), *Stress at work* (pp. 81-105). Chichester: John Wiley & Sons.

Cooper, C. L., & Payne, R. L. (1991). Introduction. In C. L. Cooper & R. Payne (Eds.), *Personality and stress: Individual differences in the stress process* (pp. 1-4). Chichester: John Wiley & Sons.

Cooper, C. L., & Payne, R. L. (1992). International perspectives on research into work, well-being, and stress management. In J. C. Quick, L. R. Murphy, & J. J. Hurrell, Jr. (Eds), *Stress & well-being at work: Assessments and interventions for occupational mental health* (pp. 348-368). Washington, DC: American Psychological Association.

Cooper, D., & Robertson, I. T. (1995). *The psychology of personnel selection: A quality approach.* London, Routledge.

Cooper, C. L., Sloan, S. J., & Williams, S. (1988). *Occupational stress indicator: Management guide*. Windsor, UK: NFER-NELSON.

Cooper, C. L., Sloan, S. J., & Williams, S. (1989). *Occupational stress indicator: Data supplement 1989.* Windsor: NFER-NELSON.

Cooper, C. L., & Williams, J. (1991). A validation study of the OSI on a blue-collar sample. *Stress Medicine, 7,* 109-112.

Cordery, J. L., Mueller W. S., & Smith, L. M. (1991). Attitudinal and behavioral effects of autonomous group working: A longitudinal field study. *Academy of Management Journal, 34*, 464-476.

Cordery, J. L., & Sevastos, P. P. (1993). Responses to the original and revised Job Diagnostic Survey: Is education a factor in response to negatively worded items? *Journal of Applied Psychology, 78*, 141-143.

Corey, G. (1986). *Theory and practice of counseling and psychotherapy* (3rd ed.). Monterey, California: Brooks/Cole Publishing Company.

Cox, T. (1978). *Stress.* London: Macmillan Press Ltd.

Cox, T. (1985a). The nature and measurement of stress. *Ergonomics, 28,* 1155-1163.

Cox, T. (1985b). Repetitive work: Occupational stress and health. In C. L. Cooper, & M. J. Smith (Eds.), *Job stress and blue collar work* (pp. 85-112). Chichester: John Wiley & Sons.

Cox, T. (1987). Stress, coping and problem solving. *Work & Stress, 1,* 5-14.

Cox, T. (1990). The recognition and measurement of stress: Conceptual and measurement issues. In J. R. Wilson & E. N. Corlett (Eds.), *Evaluation of human work: A practical ergonomics methodology* (pp. 628-647). New York: Taylor & Francis.

Cox, T. (1991). Editorial comment: Organisational culture, stress, and stress management. *Work & Stress, 5,* 1-4.

Cox, T., Boot, N., & Cox, S (1989). Stress in schools: A problem solving approach. In M. Cole & S. Walker (Eds.), *Teaching and stress* (pp. 99-113). Milton Keynes: Open University Press.

Cox, S., & Cox, T. (1991). The structure of employee attitudes to safety: A European example. *Work & Stress, 5,* 93-106.

Cox, T., & Ferguson, E. (1991). Individual differences, stress and coping. In C. L. Cooper & R. Payne (Eds.), *Personality and stress: Individual differences in the stress process* (pp. 7-30). Chichester: John Wiley & Sons.

Cox, T., & Ferguson, E. (1994). Measurement of the subjective work environment. *Work & Stress, 8,* 98-109.

Cox, T., & Howarth, I. (1990). Editorial Comment: Organisational health, culture and helping. *Work and Stress, 4,* 107-110.

Cox, T., Leather, P., & Cox, S. (1990). Stress, health and organisations. *Occupational Health Review, February/March,* 13-18.

Cox, T., & Mackay, C. (1981). A transactional approach to occupational stress. In E. N. Corlett & J Richardson (Eds.), *Stress, work design, and productivity* (pp. 91-113). Chichester: John Wiley & Sons.

Coyne, J. C., & DeLongis, A. (1986). Going beyond social support: The role of social relationships in adaptation. *Journal of Consulting and Clinical Psychology, 54,* 454-460.

Crittenden, N. (1991). *Thoughtful feeling and feelingful thinking - an evolutionary step.* Unpublished PhD Thesis, University of Wollongong, NSW.

Crump, J. H., Cooper, C. L., & Smith, M. (1980). Investigating occupational stress: A methodological approach. *Journal of Occupational Behaviour,* 1, 191-204.

Crump, J. H., Cooper, C. L., & Maxwell, V. B. (1981). Stress among air traffic controllers: Occupational sources of coronary heart disease risk. *Journal of Occupational Behaviour, 2,* 293-303.

Cummings, T. G., & Cooper, C. L. (1979). A cybernetic framework for studying occupational stress. *Human Relations, 32,* 395-418.

Cunha, R. C., Cooper, C. L., Moura, M. I., Reis, M. E., & Fernandes, P. (1992). Portuguese version of the OSI: A study of reliability and validity. *Stress Measurement, 8,* 247-251.

Daleva, M. (1987). Metabolic and neurohormonal reactions to occupational stress. In R. Kalimo, M. A. El-Batawi & C. L. Cooper (Eds.), *Psychosocial factors at work and their relation to health* (pp. 48-63). Geneva: World Health Organization.

Davidson, M. J., & Cooper, C. L. (1984). Occupational stress in female managers: A comparative study. *Journal of Management Studies, 21,* 185-205.

Davies, M., Stankov, L., & Roberts, R. D. (1998). Emotional intelligence: In search of an elusive construct. *Journal of Personality and Social Psychology, 75,* 989-1015.

Davis, A. J. (1996). A re-analysis of the Occupational Stress Indicator. *Work & Stress, 10,* 174-182.

Dawis, R. V. (1987). Scale construction. *Journal of Counseling Psychology, 34,* 481-489.

Dawson, P. (1996). *Technology and quality: Change in the workplace.* London, International Thomson Business Press.

DeFrank, R. S. (1988). Psychometric measures of occupational stress: Current concerns and future directions. In J. J. Hurrell, L. R. Murphy, S. L. Sauter, & C. L. Cooper (Eds.), *Occupational stress: Issues and developments in research* (pp. 54-65). New York: Taylor & Francis.

Dewe, P. J. (1986). An investigation into the causes and consequences of teacher stress. *New Zealand Journal of Educational Studies, 21,* 145-157.

Dewe, P. J. (1987). Identifying the nature of nurses' stress: A survey of New Zealand nurses. *Work & Stress, 1,* 15-24.

Dewe, P. (1989). Examining the nature of work stress: Individual evaluations of stressful experiences and coping. *Human Relations, 42,* 993-1013.

Dewe, P. (1991a). Measuring Work Stressors: the role of frequency, duration, and demand. *Work & Stress, 5,* 77-91.

Dewe, P. (1991b). Primary appraisal, secondary appraisal and coping: Their role in stressful work encounters. *Journal of Occupational Psychology, 64,* 331-351.

Dewe, P. (1992). The appraisal process: Exploring the role of meaning, importance, control and coping in work stress. *Anxiety, Stress and Coping , 5,* 95-109.

Dewe, P. (1993). Editorial: Work stress and coping: Common pathways for future research? *Work & Stress, 7,* 1-3.

Dewe, P., & Brook, R. (1997). Sequential tree analysis of work stressors: Exploring score profiles in the context of the stressor-stress relationship. *Best Paper & Abstract Proceedings, Second Biennial Australian Industrial & Organisational Psychology Conference, Melbourne, Victoria, Australia June 27-29, 1997.* The Australian Psychological Society Limited.

Dewe, P., Cox, T., & Ferguson, E. (1993). Individual strategies for coping with stress at work: A review. *Work & Stress, 7,* 5-15.

Dewey, J. & Bentley, A. F. (1949). *Knowing and the known.* Westport, Connecticut: Greenwood Press Publishers.

Dooley, D., Rook, K., & Catalano, R. (1987). Job and non-job stressors and their moderators. *Journal of Occupational Psychology, 60,* 115-132

Earnshaw, J., & Cooper, C. L. (1994). Employee stress litigation: The UK experience. *Work & Stress, 8,* 287-295.

Edwards, J. R. (1988). The determinants and consequences of coping with stress. In C. L. Cooper & R. Payne (Eds.), *Causes, coping and consequences of stress at work* (pp. 233-263). Chichester: John Wiley & Sons.

Edwards, J. R. (1991). The measurement of Type A behavior pattern: An assessment of criterion-oriented validity, content validity, and construct validity. In C. L. Cooper & R. Payne (Eds.), *Personality and stress: Individual differences in the stress process* (pp. 152-180). Chichester: John Wiley & Sons.

Edwards, J. R. (1992). A cybernetic theory of stress, coping, and well-being in organizations. *Academy of Management Review, 17,* 234-274.

Edwards, J. R., & Baglioni A. J. Jr. (1993). The measurement of coping with stress: Construct validity of the Ways of Coping Checklist and the Cybernetic Coping Scale. *Work & Stress, 7,* 17-31.

Edwards, J. R., & Cooper, C. L. (1988). Editorial. Research in stress, coping, and health: Theoretical and methodological issues. *Psychological Medicine, 18,* 15-20.

Edwards, J. R., & Cooper, C. L. (1990). The person-environment fit approach to stress: Recurring problems and some suggested solutions. *Journal of Organisational Behaviour, 11,* 293-307.

Ellis, A., & Bernard, M. E. (1985). What is Rational-Emotive Therapy (RET)? In A. Ellis & M. E. Bernard (Eds.), *Clinical applications of rational emotive therapy.* (pp. 1-30). New York: Plenum Press.

Eysenck, H. J., & Eysenck, S. B. (1964). *Manual of the Eysenck Personality Inventory.* London: Hodder and Stoughton.

Feather, N. T. (1992). Expectancy-value theory and unemployment effects. *Journal of Occupational and Organizational Psychology, 65,* 315-330.

Feather, N. T. (1996). Social comparisons across nations: Variables relating to the subjective evaluation of national achievement and to personal and collective self-esteem. *Australian Journal of Psychology, 48,* 53-63

Fenlason, K. J., & Beehr, T. A. (1994). Social support and occupational stress: Effects of talking to others. *Journal of Organizational Behavior, 15,* 157-175.

Feuerstein, M., Labbe', E. E., & Kuczmierczyk, A. J. (1986). *Health psychology: A physiological perspective.* New York: Plenum Press.

Fimian, M. J. (1984). The development of an instruement to measure occupational stress in teachers: The Teacher Stress Inventory. *Journal of Occupational Psychology, 57,* 277-293.

Fineman, S., & Payne, R. (1981). Role stress-a methodological trap? *Journal of Occupational Behaviour, 2,* 51-64.

Finstad, N. (1998). The rhetoric of organisational change. *Human Relations, 51*, 717-740.

Firth-Cozens, J. (1992). The role of early family experiences in the perception of organizational stress: Fusing clinical and organizational perspectives. *Journal of Occupational and Organizational Psychology, 65*, 61-75.

Firth-Cozens, J., & Hardy, G. E. (1992). Occupational stress, clinical treatment and changes in job perceptions. *Journal of Occupational and Organizational Psychology, 65,* 81-88.

Fisher, S. (1988). Methodological Factors in the investigation of stress and health at work: The development of the epidemiological problem analysis approach. In J. J. Hurrell, L. R. Murphy, S. L. Sauter, & C. L. Cooper (Eds.), *Occupational stress: Issues and developments in research* (pp. 75-87). New York: Taylor & Francis.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behaviour: An introduction to theory and research.* Massachusetts: Addison-Wesley.

Flanagan, J. (1954). The critical incident technique. *Psychological Bulletin, 51,* 327-358.

Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology, 46*, 839-852.

Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology, 48,* 150-170.

French, J. R. P. Jr., Caplan, R. D., & Van Harrison, R. (1982). *The mechanisms of job stress and strain.* New York: John Wiley & Sons.

French, J. P. R. Jr., & Kahn, R. L. (1962). A programmatic approach to studying the industrial environment and mental health. *The Journal of Social Issues, 18,* 1-47.

French, J. R. P. Jr., Rogers, W., & Cobb, S. (1974). Adjustment as person-environment fit. In G. V. Coelho, D. A. Hamburg & J. E. Adams (Eds.), *Coping and adaptation* (316-333). New York: Basic Books.

Frese, M., & Zapf, D. (1988). Methodological issues in the study of work stress: Objective vs subjective measurement of work stress and the question of longitudinal studies. In Cooper, C. L. & Payne, R. (Eds.), *Causes, coping and consequences of stress at work* (pp. 375-411). New York: John Wiley & Sons.

Funk, S. C., & Houstan, B. K. (1987) A critical analysis of the hardiness scale's validity and utility. *Journal of Personality and Social Psychology, 53,* 572-578.

Ganster, D. C., Fusilier, M. R., & Mayes, B. T. (1986). Role of social support in the experience of stress at work. *Journal of Applied Psychology, 71*, 102-110.

Gelman, V. S., Jory, M. K., & Macris, P. G. (1998). Personality factors in mothers of children who wake at night. *Australian Journal of Psychology, 50,* 25-28.

Glowinkowski, S. P., & Cooper, C. L. (1985). Current issues in Organizational stress research. *Bulletin of the British Psychological Society, 38,* 212-216.

Glowinkowski S. P., & Cooper, C. L. (1987). Managers and professionals in business/industrial settings: The research evidence. In J. M. Ivancevich & D. C. Ganster (Eds.), *Job stress: From theory to suggestion* (pp.177-193), New York: The Haworth Press

Gotts, G., & Cox, T. (1988). *Stress and Arousal Checklist: A manual for its administration, scoring and interpretation.* Melbourne: Swinburne Press.

Gowler, D. & Legge, K. (1980). Evaluative practices as stressors in occupational settings. In C. L. Cooper & R. Payne (Eds), *Current concerns in occupational stress* (pp. 213-242). New York: John Wiley & Sons.

Greenhaus, J. H., Seidel, C., & Marinis, M. (1983). The impact of expectations and values on job attitudes. *Organizational Behavior and Human Performance, 31,* 394-417.

Gulowsen, J. (1972). A measure of work-group autonomy. In L. E. Davis & J. C. Taylor (Eds.), *Design of jobs: Selected readings* (pp. 374-390). Harmondsworth: Penguin Books.

Hackman, R. J., & Oldham G. R. (1975). Development of the job diagnostic survey. *Journal of Applied Psychology, 60,* 159-170.

Hammond, G. (1996). The objections to null hypothesis testing as a means of analysing psychological data. *Australian Journal of Psychology, 48,* 104- 106.

Handy, J. A. (1988). Theoretical and methodological problems within occupational stress and burnout research. *Human Relations, 41,* 351-369.

Harris, J. R. (1995). An examination of the transactional approach in occupational stress research. In R. Crandall & P. L. Perrewe' (Eds.), *Occupational stress: A handbook* (pp. 21-28). Washington: Taylor & Francis.

Hart, P. M. (1995). Modeling the causes of occupational stress: Problems in the application of structural equation analysis. *Program and Abstracts: Inaugural Australian Industrial & Organisational Psychology Conference, 14-16 July, 1995.* The Australian Psychological Society Limited.

Hart, P. M., & Wearing, A. J. (1995). Occupational stress and well-being: A systematic approach to research, policy and practice. In P. Cotton (Ed.), *Psychological health in the workplace: Understanding and managing occupational stress* (pp. 185-216). Melbourne: Australian Psychological Society Ltd.

Heider, F. (1958). *The psychology of interpersonal relations.* New York: John Wiley & Sons.

Heinisch, D. A., Jex, S. M. (1997). Negative affectivity and gender as moderators of the relationship between work-related stressors and depressed mood at work. *Work & Stress, 11,* 46-57.

Heinisch, D. A., Jex, S. M. (1998). Measurement of negative affectivity: A comparison of self-reports and observer ratings. *Work & Stress, 12,* 145-160.

Henderson, S., Duncan-Jones, P., Byrne, D. G., & Scott, R. (1980). Measuring social relationships: the Interview Schedule for Social Interaction. *Psychological Medicine, 10,* 723-734.

Hesketh, B., & Gardner, D. (1993). Person-environment fit models: A reconceptualization and empirical test. *Journal of Vocational Behavior, 42,* 315-332.

Hesketh, B., & Myors, B. (1997). How should we measure fit in organisational psychology—or should we. *Australian Psychologist,* 32, 71-76.

Hobfoll, S. E. (1988). *The ecology of stress.* New York: Hemisphere Publishing Corporation.

Hobhouse, L. T. (1896). The theory of knowledge. London: Methuen & Co. Ltd.

Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research, 11,* 213-218.

Howard, G. S. (1994). Why do people say nasty things about self-reports? *Journal of Organizational Behavior, 15,* 399-404.

Howell, D. C. (1992). *Statistical methods for psychology* (3rd ed.). Belmont, California: Duxbury Press

Hulin, C. L., & Blood, M. R. (1968). Job enlargement, individual differences and workers responses. *Psychological Bulletin, 69,* 41-55.

Hull, J. G., Van Treuren, R. R., & Virnelli, S. (1987). Hardiness and Health: A Critique and Alternative Approach. *Journal of Personality and Social Psychology, Vol. 53*, 518-530.

Hurrell, Jr., J. J., Nelson, D, L., & Simmons, B. L. (1998). Measuring job stressors and strains: Where we have been, where we are, and where we need to go. *Journal of Occupational Health Psychology, 3*, 368-389.

Ivancevich, J. M., & Matteson, M. T. (1980). *Stress at work - A managerial perspective*. Glenview, Illinois: Scott, Foresman and Company.

Ivancevich, J. M., & Matteson, M. T. (1984). Stress Diagnostic Survey (SDS): Comments and psychometric properties of a multi-dimensional self-report inventory. Unpublished manuscript, University of Houston, Texas.

Ivancevich, J. M., & Matteson, M. T. (1988). Application of the triangulation strategy to stress research. In J. J. Hurrell, L. R. Murphy, S. L. Sauter, & C. L. Cooper (Eds.), *Occupational Stress: Issues and developments in research* (pp. 200-215). New York: Taylor & Francis.

Jaccard, J., & Becker, M. A. (1990). *Statistics for the behavioral sciences* (2nd ed.). Belmont: Wadsworth Publishing Company.

James, L. A., & James, L. R. (1989). Integrating work environment perceptions: Explorations into the measurement of meaning. *Journal of Applied Psychology, 74,* 739-751.

James, L. R., & Jones, A. P. (1974). Organizational climate: A review of theory and research. *Psychological Bulletin, 81,* 1096-1112.

James, L. R., & Jones, A. P. (1980). Perceived job characteristics and job satisfaction: An examination of reciprocal causation. *Personnel Psychology, 33,* 97-135.

James, W. (1890). *The principles of psychology (vol. 1).* London: MacMillan.

Jex, S. M., & Spector, P. E. (1996). The impact of negative affectivity on stressor-strain relations: A replication and extension. *Work & Stress, 10,* 36-45.

Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly, 24,* 602-611.

Jick, T. D. (1985). As the axe falls: Budget cuts and the experience of stress in organizations. In T. A. Beehr & R. S. Bhagat, *Human stress and cognition in organizations: An integrated perspective* (pp. 83-114). New York: John Wiley & Sons.

Jimmieson, N. L., & Terry, D. J. (1993). The effects of prediction, understanding, and control: A test of the stress antidote model. *Anxiety, Stress, and Coping, 6,* 179-199.

Johnson, S. M., Smith, P. C., & Tucker, S. M. (1982). Response format of the job descriptive index: Assessment of reliability and validity by the multitrait-multimethod method. *Journal of Applied Psychology, 67,* 500-505.

Judd, C. M. & McClelland, G. H. (1989). *Data analysis: A model-comparison approach.* San Diego: Harcourt Brace Jovanovich.

Jurgensen, C. E. (1978). Job preferences (what makes a job good or bad?). *Journal of Applied Psychology, 63,* 267-276.

Kagan, N. I., Kagan (Klein), H., & Watson, M. G. (1995). Stress reduction in the workplace: The effectiveness of psychoeducational programs. *Journal of Counseling Psychology, 42,* 71-78.

Kahn, R. L. (1970). Some propositions toward a researchable reconceptualization of stress. In J. E. McGrath (Ed.), *Social and psychological factors in stress* (pp. 97-103). New York: Holt, Rinehart & Winston.

Kahn, R. L., & Byosiere, P. (1992). Stress in organizations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology,* Second edition, Volume 3 (pp. 571-650). Palo Alto: Consulting Psychologists Press Inc.

Kahn, R. L. & French, Jr., J. R. P. (1962). A summary and some tentative conclusions. *The Journal of Social Issues, 18,* 122-127.

Kahn, R. L., Wolfe, D. M. Snoek, J. D. & Rosenthal, R. A. (1964). *Organizational stress: Studies in role conflict and ambiguity.* New York: John Wiley & Sons.

Kaplan, H. B. (1983). Psychological distress in sociological context: Toward a general theory of psychological stress. In H. B. Kaplan (Ed.), *Psychosocial Stress: Trends in Theory and Research* (pp. 195-264). New York: Academic Press.

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly, 24,* 285-308.

Karasek, R., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., & Amick, B. (1998). The Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology, 3,* 322-355.

Kasl, S. V. (1978). Epidemiological contributions to the study of work stress. In C. L. Cooper & P. Payne (Eds.), *Stress at work* (pp. 3-48 . Chichester: John Wiley & Sons.

Kasl, S. V. (1984). Stress and health. *Annual Review Public Health, 5,* 319-341.

Kasl, S. V. (1987). Methodologies in stress and health: Past difficulties, present dilemmas, future directions. In S. V. Kasl & C. L. Cooper (Eds.), *Stress and health: Issues in research methodology* (pp. 307-318). Chichester: John Wiley & Sons.

Kasl, S. V. (1996). Theory of stress and health. In C. L. Cooper (Ed.), *Handbook of stress, medicine, and health* (pp. 13-26). Boca Raton: CRC Press.

Kasl, S. V. (1998). Measuring job stressors and studying the health impact of the work environment: An epidemiological commentary. *Journal of Occupational Health Psychology, 3*, 390-401.

Katz, D., & Kahn, R. L. (1978). *The social psychology of organizations* (2nd ed). New York: John Wiley & Sons.

Kelloway, E. K., & Barling, J. (1991). Job characteristics, role stress and mental health. *Journal of Occupational Psychology, 64,* 291-304.

Kelly, G. (1955). *The Psychology of Personal Constructs, Vol. 1 & 2* . New York: Norton.

Kilpatrick, F P. (1961). Introduction. In F. P. Killpatrick (Ed.), *Explorations in trans-actional psychology* (pp. 1-5). New York: University Press.

Kirk, A., Brown, D. F., & Smith, P. A. (1995). Task-specific dimensions of self-efficacy predicting multi-task performance in a blue-collar industry. *Program and Abstracts: Inaugural Australian Industrial & Organisational Psychology Conference, 14-16 July, 1995.* The Australian Psychological Society Limited.

Kirk, A. K., Stanley, G. V. & Brown, D. F. (1988). Changes in patients' stress and arousal levels associated with therapists' perception of their requests during crisis intervention. *British Journal of Clinical Psychology, 27,* 363-369.

Kirkcaldy, B. D., & Cooper, C. L. (1992). Cross-cultural differences in occupational stress among British and German managers. *Work & Stress, 6*, 177-190.

Kobasa, S. C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal of Personality and Social Psychology, 37,* 1-11.

Kobasa, S. C. (1982). The hardy personality: Toward a social psychology of stress and health. In G. S. Sanders & J. Suls, *Social psychology of health and illness* (pp. 3-32). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Kobasa, S. C., Maddi, S. R. & Kahn, S. (1982). Hardiness and health: A prospective study. *Journal of Personality and Social Psychology, 42*, 168-177.

Koeske, G, F., Kirk, S. A., & Koeske, R. D. (1993). Coping with work stress: Which strategies work best. *Journal of Occupational and Organizational Psychology, 66,* 319-335.

Kompier, M., De Gier, E., Smulders, P., & Draaisma, D. (1994). Regulations, policies and practices concerning work stress in five European countries. *Work & Stress, 8,* 296-318.

Kulik, C. T., Oldham, G. R., & Hackman, J. R. (1987). Work design as an approach to person-environment fit. *Journal of Vocational Behavior, 31*, 278-296.

Landsbergis, P. A., & Vivona-Vaughan, E. (1995). Evaluation of an occupational stress intervention in a public agency. *Journal of Organizational Behavior, 16*, 29-48.

Lalljee, M., Brown, L. B., & Ginsburg, G. P. (1984). Attitudes: Disposition, behaviour or evaluation?. *British Journal of Social Psychology, 23,* 233-244.

Landy, F. (1982). Models of man: Assumptions of theorists. In N. Nicholson & T. D. Wall (Eds.), *The theory and practice of organizational psychology: A collection of original essays* (pp. 103-121). London: Academic Press.

Lazarus, R. S. (1966). *Psychological stress and the coping process.* New York: McGraw-Hill Book Company.

Lazarus, R. S. (1967). Cognitive and personality factors underlying threat and coping. In M. H. Appley & R. Trumbull (Eds.), *Psychological stress: Issues in Research* (pp. 151-169). New York: Appleton-Century-Crofts.

Lazarus, R. S. (1982). Thoughts on the relations between emotion and cognition. *American Psychologist, 37,* 1019-1024.

Lazarus, R. S. (1984). On the primacy of cognition. *American Psychologist, 39,* 124-129.

Lazarus, R. S. (1987). Individual susceptibility and resistance to psychological stress. In R. Kalimo, M. A. El-Batawi & C. L. Cooper (Eds.). *Psychosocial factors at work and their relation to health* (pp. 127-133). Geneva: World Health Organization.

Lazarus, R. S. (1990). Theory-based stress measurement. *Psychological Inquiry, 1,* 3-13.

Lazarus, R. S. (1993). From psychological stress to the emotions: A history of changing outlooks. *Annual Review Psychology, 44,* 1-21.

Lazarus, R. S. (1995). Psychological stress in the workplace. In R. Crandall & P. L. Perrewe' (Eds.), *Occupational stress: A handbook* (pp. 3-14). Washington: Taylor & Francis.

Lazarus, R. S., Cohen, J. B., Folkman, S., Kanner, A., & Schaefer, C. (1980). Psychological stress and adaptation: Some unresolved issues. In H. Selye (Ed.), *Selye's guide to stress research, Volume 1* (pp. 90-117). New York: Van Nostrand Reinhold Company.

Lazarus, R. S., Deese, J., & Osler, S. F. (1952). The effects of psychological stress upon performance. *Psychological Bulletin, 49,* 293-317.

Lazarus, R. S., DeLongis, A., Folkman, S. & Gruen, R. (1985). Stress and adaptational outcomes: The problem of confounded outcomes. *American Psychologist, 40,* 770-779.

Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal and Coping.* New York: Springer Publishing Company.

Lazarus, R. S., & Folkman, S. (1986). Cognitive theories of stress and the issue of circularity. In M. H. Appley & R. Trumbull (Eds.), Dynamics of stress: Physiological, psychological and social perspectives (pp. 63-80). New York: Plenum Press.

Lazarus, R. S., & Folkman, S (1987). Transactional theory and research on emotions and coping. *European Journal of Personality, 1,* 141-169.

Lazarus, R. S., & Launier, R. (1978). In L. A. Pervin & M. Lewis (Eds.), *Perspectives in interactional psychology* (pp. 287-327). New York: Plenum Press.

Lehman, Jr., E. C. (1972). An Emperical note on the transactional model of psychological stress. *The Sociological Quarterly,* 13, 484-495.

Lepore, S. J. (1995). Measurement of chronic stressors. In S. Cohen, R. C. Kessler, & L. Underwood Gordon (Eds.), *Measuring stress: A guide for health and social scientists* (pp. 102-120). New York: Oxford University Press.

Levi, L. (1987). Fitting work to human capacities and needs: Improvements in the content and organization of work. In R. Kalimo, M. A. El-Batawi & C. L. Cooper (Eds.). *Psychosocial factors at work and their relation to health* (pp. 168-184). Geneva: World Health Organization.

Levi, L. (1996). Spice of life or kiss of death. In C. L. Cooper (Ed.), *Handbook of Stress, Medicine, and Health* (pp. 1-10). New York: CRC Press.

Levin, J. (1965). Three-Mode Factor Analysis. *Psychological Bulletin, 64,* 442-452.

Locke, E. A. (1965). The relationship of task success to task liking and satisfaction. *Journal of Applied Psychology, 49,* 379-385.

Locke, E. A. (1967). Relationship of success and expectation to affect on goal-seeking tasks. *Journal of Personality and Social Psychology, 7,* 125-134.

Locke, E. A. (1968). Toward a theory of task motivation and incentives. *Organizational Behavior and Human Performance, 3,* 157-189.

Locke, E. A. (1969). What is job satisfaction. *Organizational Behavior and Human Performance, 4,* 309-336.

Locke, E. A. (1976). The nature and causes of job satisfaction. In M. D. Dunnette (Ed.), *Handbook of Industrial and Organizational Psychology* (pp. 1297-1349). Chicago: Rand-McNally.

Locke, E. A. (1984). Job satisfaction. In M. Gruneberg & T. Wall (Eds.), Social psychology and organizational behaviour (pp. 93-117). Chichester: John Wiley & Sons.

Lu, L., Cooper, C. L., Chen, Y. C., Hsu, C. H., Wu, H. L., Shih, J. B., & Li, C. H. (1997). Chinese version of the OSI: A validation study. *Work & Stress, 11,* 79-86.

Lundberg, C. C. (1988). Working with culture. *Journal of Organisational Change Management,1,* 38-47.

Madden, C. C., Summers, J. J., & Brown, D. F. (1990). The influence of perceived stress on coping with competitive basketball. *International Journal of Sport Psychology, 21,* 21-35.

Maddi, S. R., Bartone, P. T., & Puccetti M. C. (1987). Stressful events are indeed a factor in physical illness: reply to Schroeder and Costa (1984). Journal of Personality and Social Psychology, 52, 833-843.

Marsella, A. J. (1994). The measurement of emotional reactions to work: Conceptual, methodological and research issues. *Work & Stress, 8,* 153-176.

Marshall, J., & Cooper, C. L. (1979). *Executives under pressure.* London: Macmillan Press.

Marshall, J., & Cooper, C. L (1981). The causes of managerial job stress: A research note on methods and initial findings. In E. N. Corlett & J. Richardson (Eds.), Stress, work design, and productivity (pp. 115-128). Chichester: John Wiley & Sons.

McGee, G. W., Goodson, J. R., & Cashman, J. F. (1987). Job stress and job satisfaction: Influence of contextual factors. *Psychological Reports, 61,* 367-375.

McCormick, E. J., & Ilgen, D. (1981). *Industrial psychology* (7th ed.). London: George Allen & Unwin.

McGartland, M., & Polgar, S. (1994). Paradigm collapse in psychology: the necessity for a "two methods" approach. *Australian Psychologist, 29,* 21-28.

McGrath, J. E. (1970a). Major methodological issues. In J. E. McGrath (Ed.), *Social and psychological factors in stress* (pp. 41-57). New York: Holt, Rinehart & Winston.

McGrath, J. E. (1970b). A conceptual formulation for research on stress. In J. E. McGrath (Ed.), *Social and psychological factors in stress* (pp. 10-21). New York: Holt, Rinehart & Winston.

McGrath, J. E. (1970c). Settings, measures and themes: An integrative review of some research on social-psychological factors in stress. In J. E. McGrath (Ed.), *Social and psychological factors in stress* (pp. 58-96). New York: Holt, Rinehart & Winston.

McGrath, J. E. (1970d). Some strategic considerations for future research on social-psychological stress. In J. E. McGrath (Ed.), *Social and psychological factors in stress* (pp. 348-352). New York: Holt, Rinehart & Winston.

McGrath, J. E. (1976). Stress and behavior in organizations. In M. D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 1351-1395). New York: Chicago: Rand-McNally.

McGuigan, J. R., & Moyer, R. C. (l986). *Managerial economics* (4th ed.). St. Paul: West Publishing Company.

McMichael, A. J. (1978). Personality, behavioural, and situational modifiers of work stressors. In C. L. Cooper & R. Payne (Eds.), *Stress at work* (pp. 127- 147). Chichester: John Wiley & Sons.

Melin, B., Lundberg, U., Söderlund, J., & Granqvist, M. (1999). Psychological and physiological stress reactions of male and female assembly workers: A comparison between two different forms of work organization. *Journal of Organizational Behavior, 20,* 47-61.

Mendenhall, W., & Ott, L. (1980). *Understanding statistics* (3rd ed). Massachusetts: Duxbury Press.

Mendenhall, W., & Reinmuth, J. E. (1978). Statistics for management and economics (3rd ed.). Massachusetts: Duxbury Press.

Mischel, W. (1973). Toward a cognitive social learning reconceptualization of personality. *Psychological Review, 80,* 252-283.

Morey, N. C., & Luthans, F (1984). An emic perspective and ethnoscience methods for organizational research. *Academy of Management Review, 9,* 27-36.

Monroe, S. M., & Kelley, J. M. (1995). Measurement of stress appraisal. In S. Cohen, R. C. Kessler, & L. Underwood Gordon (Eds.), *Measuring stress: A guide for health and social scientists* (pp. 102-120). New York: Oxford University Press

Motowidlo, S. J., Packard, J. S., & Manning, M. R. (1985). Occupational Stress: Its Causes and Consequences for Job Performance. *Journal of Applied Psychology, 71,* 618-629.

Moyle, P. (1995). The role of negative affectivity in the stress process: Tests of alternative models. *Journal of Organizational Behavior, 16,* 647-668.

Murphy, C. J., & Smith, P. A. (1995). Differences in response to leadership style by followers with different skill levels working in multiskilled teams. *Program and Abstracts: Inaugural Australian Industrial & organisational Psychology Conference, 14-16 July, 1995.* The Australian Psychological Society Limited.

Nachmias, D., & Nachmias, C. (1981). *Research methods in the social sciences* (2nd ed.). New York: St. Martin's Press.

Narayanan, L., Menon, S., & Spector, P. E. (1999). Stress in the workplace: A comparison of gender and occupations. *Journal of Organizational Behavior, 20,* 63-73.

Neale, J. M., Hooley, J. M., Jandorf, L., & Stone, A. A. (1987). Daily life events and mood. In C. R. Snyder & C. E. Ford (Eds.), *Coping with negative life events: Clinical and social psychological perspectives* (pp. 161-189). New York: Plenum Press.

Newton, T. J. (1989). Occupational stress and coping with stress: A critique. *Human Relations, 42,* 441-461.

Newton, T. J., & Keenan, A. (1985). Coping with work related stress. *Human Relations, 38,* 107-126.

Norusis, M. J. (1988a). *SPSS/PC+ V2.O Base Manual.* Chicago: SPSS Inc.

Norusis, M. J. (1988b). *SPSS/PC+ Advanced Statistics V2.O.* Chicago: SPSS Inc.

Nystedt, L. & Magnusson, D. (1982). Construction of experience: The construction corollary. In J. C. Mancuso & J. R. Adams-Webber (Eds.), *The construing person* (pp. 33-44). New York: Praeger Scientific.

O'Driscoll, M. P. & Cooper, C. L. (1994). Coping with work stress: A critique of existing measures and proposal for an alternative methodology. *Journal of Occupational and Organizational Psychology, 67,* 343-354.

Oppenheim, A. N. (1966). *Questionnaire design and attitude measurement.* London: Heinemann.

Orr, J. M., Sackett, P. R., & Dubois, C. L. Z. (1991). Outlier detection and treatment in I/O psychology: A survey of research beliefs and an empirical illustration. *Personnel Psychology, 44*, 473-486.

Osgood, C. E., (1969). On the whys and wherefores of E, P, and A. *Journal of Personality and Social Psychology, 12,* 194-199.

Osgood, C. E., Suci G. J. & Tannenbaum P. H. (1957). *The Measurement of Meaning.* Urbana, Illinois: University of Illinois Press.

Osipow, S. H., & Davis, A. S. (1988). The relationship of coping resources to occupational stress and strain. *Journal of Vocational Behaviour, 32,* 1-15.

Osipow, S. H., Doty, R. E., & Spokane, A. R. (1985). Occupational stress, strain, and coping across the life span. *Journal of Vocational Behaviour, 27,* 98-108.

Osipow, S. H., & Spokane, A. R. (1983). *A manual for measures of stress, strain and coping.* Columbus: Marathon Consulting & Press.

Osipow, S. H., & Spokane, A. R. (1984). Measuring Occupational Stress, Strain and Coping. In S. Oskamp (Ed.), *Applied Social Psychology Annual,* 5, 67-87.

Osipow, S. H., & Spokane, A. R. (1987). *Occupational stress inventory.* Odessa, Florida: Psychological Assessment Resources, Inc.

Ouellette Kobasa, S. C., Maddi, S. R., Puccetti, M. C. & Zola, M. A. (1985). Effectiveness of hardiness, exercise and social support as resources against illness. *Journal of Psychosomatic Research, 29,* 525-533.

Ouellette Kobasa, S. C. & Pucetti, M. C. (1983). Personality and social resources in stress resistance. *Journal of Personality and Social Psychology, 45*, 839-850.

Parkes, K. R. (1982). Occupational stress among student nurses: A natural experiment. *Journal of Applied Psychology, 67*, 784-796.

Parkes, K. R. (1994). Personality and coping as moderators of work stress processes: Models, methods and measures. *Work & Stress, 8,* 110-129.

Payne, R. (1978). Epistemology and the study stress at work. In C. L. Cooper & R. Payne (Eds.), *Stress at Work* (pp. 259-283). Chichester: John Wiley & Sons.

Payne, R. (1979a). Stress and cognition in organizations. In V. Hamilton & D. M. Warburton, *Human stress and cognition: An information processing approach* (pp. 301-337). New York: John Wiley & Sons.

Payne, R. L.(1979b). Demands, supports, constraints and psychological health. In C. Mackay & T. Cox (Eds.), *Response to stress: Occupational aspects* (pp. 85-105). Guildford: International Publishing Corporation.

Payne, R. (1982). The nature of knowledge and organizational psychology. In N. Nicholson & T. D. Wall (Eds.), *The theory and practice of organizational psychology: A collection of original essays* (pp. 37-67). London: Academic Press.

Payne, R. (1988a). Individual differences in the study of occupational stress. In C. L. Cooper & R. Payne (Eds.), *Causes, coping and consequences of stress at work* (pp. 209-232). Chichester: John Wiley & Sons Ltd.

Payne, R. (1988b). A longitudinal study of the psychological well-being of unemployed men and the mediating effect of neuroticism. *Human Relations, 41,* 119-138.

Payne, R. (1991). Individual Differences in Cognition and the Stress Process. In C. L. Cooper & R. Payne (Eds.), *Personality and stress: Individual differences in the stress process* (pp. 181-201). New York: John Wiley & Sons.

Payne, R. & Fletcher, B. C. (1983). Job demands, supports, and constraints as predictors of psychological strain among school teachers. *Journal of Vocational Behavior, 22,* 136-147.

Payne, R. L., Jabri, M. M., & Pearson, A. W. (1988). On the importance of knowing the affective meaning of job demands. *Journal of Organizational Behavior, 9,* 149-158.

Payne, R., Jick, T. D., & Burke, R. J. (1982). Whither stress research?: An agenda for the 1980s. *Journal of Occupational Behaviour, 3,* 131-145.

Payne, R. L. & Jones, G. (1987). Measurement and Methodological Issues in Social Support. In S. V. Kasl & C. L. Cooper (Eds.), *Stress and health: Issues in research methodology* (pp. 167-205). Chichester: John Wiley & Sons.

Payne, R., Lane, D., & Leahy, M. (1989). Work and non-work factors as perceived causes of symptoms of psychological strain. *Work & Stress, 3,* 347-351.

Peacock, E. J., & Wong, P. T. (1990). The Stress Appraisal Measure (SAM): A multi-dimensional approach to cognitive appraisal. *Stress Medicine, 6,* 227-236.

Pennebaker, J. W. & Watson, D. (1988). Self-reports and physiological measures in the workplace. In J. J. Hurrell, L. R. Murphy, S. L. Sauter, & C. L. Cooper (Eds.), *Occupational Stress: Issues and developments in research* (pp. 184-199). New York: Taylor & Francis.

Pervin, L. A. (1967). A twenty-college study of student x college interaction using TAPE (Transactional Analysis of Personality and Environment): Rationale, reliability and validity. *Journal of Educational Psychology, 58,* 290-302.

Pervin, L. A.. (1968). Performance and satisfaction as a function of individual-environment fit. *Psychological Bulletin, 69,* 56-68.

Pervin, L. A., & Lewis, M. (1978). Overview of the internal-external issue. In L. A. Pervin & M. Lewis (Eds.), *Perspectives in interactional psychology* (pp. 1-22). New York: Plenum Press.

Pettegrew, L. S., & Wolf, G. E. (1982). Validating measures of teacher stress. *American Educational Research Journal, 19,* 373-396.

Phillips, D. C., & Orton, R. (1983). The new causal principle of Cognitive Learning Theory: Perspectives on Bandura's "Reciprocal Determinism". *Psychological Review, 90,* 158-165.

Poultan, C. E. (1978). Blue collar stressors. In C. L. Cooper & R. Payne (Eds.), *Stress at Work* (pp. 51-79). Chichester: John Wiley & Sons.

Pratt, L. I., & Barling, J. (1988). Differentiating between daily events, acute and chronic stressors: A framework and its implications. In J. J. Hurrell, L. R. Murphy, S. L. Sauter, & C. L. Cooper (Eds.), *Occupational stress: Issues and developments in research* (pp. 41-53). New York: Taylor & Francis.

Rand, A. (1964). *The virtue of selfishness: a new concept of egoism.* New Jersey: New American Library.

Rand, A. (1966). Introduction to Objectivist Epistemology. New York: The Objectivist, Inc.

Rees, D. W., & Cooper, C. L. (1990). Occupational stress in health service employees. *Health Services Management Research, 3,* 163-172.

Rees, D. W., & Cooper, C. L. (1991). A criterion oriented validation study of the OSI outcome measures on a sample of health service employees. *Stress Medicine, 7,* 125-127.

Rees, D. W., & Cooper, C. L. (1992a). The Occupational Stress Indicator locus of control scale; Should this be regarded as a state rather than trait measure. *Work & Stress, 6,* 45-48.

Rees, D., & Cooper, C. L. (1992b). Occupational stress in health service workers in the UK. *Stress Medicine, 8,* 79-90.

Reynolds, S., & Shapiro, D. A. (1991). Stress reduction in transition: Conceptual problems in the design, implementation, and evaluation of worksite stress management interventions. *Human Relations, 44*, 717-733.

Rhodes, J, E., & Woods, M. (1995). Comfort and conflict in the relationships of pregnant, minority adolescents: Social Support as a moderator of social strain. Journal of Community Psychology, 23, 74-84.

Rice, R. W., Gentile, D. A., & McFarlin, D. B. (1991). Facet importance and job satisfaction. *Journal of Applied Psychology, 76,* 31-39.

Richardsen, A. M., & Burke, R. J. (1991). Occupational stress and job satisfaction among Canadian physicians. *Work & Stress, 5,* 301-313.

Rizzo, J. R., House, R. J., & Lirtzman, S. I. (1970). Role conflict and ambiguity in complex organizations. *Administrative Science Quarterly, 15,* 150-163.

Robertson, I. T., Cooper, C. L., & Williams, J. (1990). The validity of the occupational stress indicator. *Work & Stress, 4,* 29-39.

Robertson, I. T. & Smith, M. (1989). Personnel selection methods. In M. Smith & I. T. Robertson (Eds.), *Advances in selection and assessment* (pp. 89-112). Chichester: John Wiley & Sons.

Rose, J., Jones, F., & Fletcher, B. (C.). (1998). The impact of a stress management programme on staff well-being and performance at work. *Work & Stress, 12*, 112-124.

Rotter, J. B. (1966). Generalised expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied, 80,* 1-28.

Rounds, J. B., Dawis, R. V., & Lofquist, L. H. (1987). Measurement of person-environment fit and prediction of satisfaction in the theory of work adjustment. *Journal of Vocational Behavior, 31*, 297-318.

Salovey, P., & Mayer, J. D. (1990). Emotional Intelligence. *Imagination, Cognition and Personality, 9,* 185-211.

Sarason, I. G., & Johnson, J. H. (1979). Life stress, organizational stress, and job satisfaction. *Psychological Reports, 44,* 75-79.

Sarason, I. G., Johnson, J. H. & Siegel, J. M. (1978). Assessing the impact of life changes: development of the life experiences survey. *Journal of Consulting and Clinical Psychology, 46,* 932-946.

Schabracq, M. J., & Cooper, C. L. (1998). Toward a phenomenological framework for the study of work and organisational stress. *Human Relations, 51,* 625-648.

Schaubroeck, J., & Ganster, D. C. (1991). Associations among stress-related individual differences. In C. L. Cooper & R. Payne (Eds.), *Personality and stress: Individual differences in the stress process* (pp. 33-66). New York: John Wiley & Sons.

Schaubroeck, J., Ganster, D. C., & Fox, M. L. (1992). Dispositional affect and work-related stress. *Journal of Applied Psychology, 77,* 322-335.

Schmitt, N. (1994). Method variance: The importance of theory and measurement. *Journal of Organizational Behavior, 15,* 393-398.

Schriber, J. B., & Gutek, B. A. (1987). Some time dimensions of work: Measurement of an underlying aspect of organisational culture. *Journal of Applied Psychology, 72,* 642-650.

Schroeder, D. H. & Costa, Jr., P. T. (1984). Influence of life event stress on physical illness: Substantive effects or methodological flaws? *Journal of Personality and Social Psychology, 46,* 853-863.

Schuler, R. S. (1980). Definition and conceptualization of stress in organizations. *Organizational Behavior and Human Performance, 25,* 184-215.

Schuler, R. S. (1982). An integrative transactional process model of stress in organizations. *Journal of Occupational Behaviour, 3,* 5-19.

Schuler, R. S. (1985). Integrative transactional process model of coping with stress in organizations. In T. A. Beehr & R. S. Bhagat, *Human stress and cognition in organizations: An integrated perspective* (pp. 347-374). New York: John Wiley & Sons.

Schwartz, J. E., & Stone, A. A. (1993). Coping with daily work problems. Contributions of problem content, appraisals, and person factors. *Work & Stress, 7,* 47-62.

Scott, R., & Howard, A (1970). Models of stress. In S. Levine & N. A. Scotch (Eds.), *Social stress* (pp. 259-278). Chicago, Illinois: Aldine.

Sechrest, L. (1984). Reliability and validity. In A. S. Bellack & M. Hersen (Eds.), *Research methods in clinical psychology* (pp. 24-54). New York: Pergamon Press.

Segovis, J. C., Bhagat, R. S., & Coelho, G. V. (1985). The mediating role of cognitive appraisal in the experience of stressful events: A reconceptualization. In T. A. Beehr & R. S. Bhagat, *Human stress and cognition in organizations: An integrated perspective* (pp. 213-241). New York: John Wiley & Sons.

Selye, H. (1956). *The stress of life.* London: Longmans, Green & Company.

Selye, H. (1980). Preface: The purpose of this volume. In H. Selye (Ed), *Selye's guide to stress research, Volume 1* (pp. v-xiii). New York: Van Nostrand Reinhold Company.

Selye, H. (1983). The Stress Concept: Past, Present, and Future. In C. L. Cooper (Ed.), *Stress Research: Issues for the Eighties* (pp. 1-20). Chichester: John Wiley & Sons.

Semmer, N., Zapf, D., & Greif, S. (1996). 'Shared job strain': A new approach for assessing the validity of job stress measurements. *Journal of Occupational and Organizational Psychology, 69,* 293-310.

Sharit, J., Czaja, S. J., Nair, S. N., Hoag, D. W., Leonard, D. C., & Dilsen, E. K. (1998). Subjective experiences of stress, workload, and bodily discomfort as a function of age and type of computer work. *Work & Stress, 12*, 125-144.

Shirom, A. (1982). What is organisational stress? A facet analytic conceptualization. *Journal of Occupational Behaviour, 1982,* 21-37.

Siegrist, J., & Peter, R. (1994). Job stressors and coping characteristics in work-related disease: Issues of validity. *Work & Stress, 8*, 130-140.

Singh, T. N. & Baumgartel, H. (1966). Background Factors in Airline Mechanics' Work Motivation: A research note. *Journal of Applied Psychology, 50,* 357-359.

Skinner, H. A. (1984). Correlational Methods in Clinical Research. In A. S. Bellack & M. Hersen (Eds.), *Research Methods in Clinical Psychology* (pp. 139-156). New York: Pergamon Press.

Smith, M. (1994). A theory of the validity of predictors in selection. *Journal of Occupational and Organizational Psychology, 67*, 13-31.

Smith, M., Hartley, J., & Stewart, B. (1978). A case study of repertory grids used in vocational guidance. *Journal of Occupational Psychology, 51*, 97-104.

Smith, P. (1994). Shiftwork and non-work performance efficiency: A review. Keynote Address to Symposium, *Abstracts of 11th International Symposium On Night and Shiftwork* (pp. 3-4), Melbourne (Australia), February, 1994. International Commission on Occupational Health (ICOH), Scientific Committee on Shift work.

Smith, P., & Bennett, S. (1983). *Report of the joint University of Bradford and Civil Service Union studies of shift work.* Unpublished manuscript, University of Bradford, U.K.

Smith, P. A., Brown, D. F., Di Milia, L., & Wragg, C. (1993). The use of the Circadian Type Inventory as a measure of the circadian constructs of vigour and rigidity. *Ergonomics, 36*, 169-175.

Smith, P. C., Kendall, L. M., & Hulin, C. L. (1969). *The measurement of satisfaction in work and retirement: A strategy for the study of attitudes.* Chicago: Rand-McNally.

Smith, L. L., & Reise, S. P. (1998). Gender differences on negative affectivity: An IRT study on differential item functioning on the multidimensional personality questionnaire stress reaction scale. *Journal of Personality and Social Psychology, 75*, 1350-1362.

Spector, P. E. (1994). Using self-report questionnaires in OB research: A comment on the use of a controversial method. *Journal of Organizational Behavior, 15,* 385-392.

Spector, P. E., & Brannick, M. T. (1995). The nature and effects of method variance in organizational research. In C. L. Cooper & I. T. Robertson (Eds.), *International Review of Industrial and Organizational Psychology, Volume 10* (pp. 249-274). Chichester: John Wiley & Sons.

Spector, P. E., & Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: Interpersonal Conflict at Work Scale, Organizational Constraints Scale, Quantitative Workload Inventory, and Physical Symptoms Inventory. *Journal of Occupational Health Psychology, 3*, 356-367.

Spector, P. E., & O'Connell, B. J. (1994). The contribution of personality traits, negative affectivity, locus of control and Type A to the subsequent reports of job stressors and job strains. *Journal of Occupational and Organizational Psychology, 67,* 1-11.

Spencer, A. J., & Brown, D. F. (1986). Transition from school-based to community-based dental services. *Community Health Studies, 10,* 12-18.

Spielberger, C. D., & Reheiser, E. C. (1995). Measuring occupational stress: The Job Stress Survey. In R. Crandall & P. L. Perrewe' (Eds.), *Occupational stress: A handbook* (pp. 51-69). Washington: Taylor & Francis.

Steers, R. M., & Porter, L. M. (1991). *Motivation and work behavior (5th ed.).* New York: McGraw-Hill, Inc.

Stone, E. F. & Hollenbeck, J. R. (1989). Clarifying some controversial issues surrounding statistical procedures for detecting moderator variables: Empirical evidence and related matters. *Journal of Applied Psychology, 74,* 3-10.

Sutherland, V. J., & Cooper, C. L. (1988). Sources of work stress. In J. J. Hurrell, L. R. Murphy, S. L. Sauter, & C. L. Cooper (Eds.), *Occupational Stress: Issues and developments in research* (pp. 3-40). New York: Taylor & Francis.

Sutherland, V., & Davidson, M. J. (1993). Using a stress audit: The construction site manager experience in the UK. *Work & Stress, 7,* 273-286.

Tabachnick, B. G., & Fidell, L. S. (1983). *Using Multivariate Statistics.* New York: Harper & Row, Publishers.

Tabachnick, B. G., & Fidell, L. S. (1989). *Using Multivariate Statistics* (2nd ed). New York: Harper & Row, Publishers.

Terry, D. J. (1991). Predictors of subjective stress in a sample of new parents. *Australian Journal of Psychology, 43,* 29-36.

Tetrick, L. E. (1992). Mediating effect of perceived role stress: A confirmatory analysis. In J. C. Quick, L. R. Murphy, & J. J. Hurrell, Jr. (Eds), *Stress & well-being at work: Assessments and interventions for occupational mental health* (pp. 134-152). Washington, DC: American Psychological Association.

Tetrick, L. E. & LaRocco, J. M. (1987). Understanding, prediction, and control as moderators of the relationships between perceived stress, satisfaction, and psychological well-being. *Journal of Applied Psychology, 72,* 538-543.

Travers, C. L., & Cooper, C. L. (1993). Mental health, job satisfaction and occupational stress among UK teachers. *Work & Stress, 7,* 203-219.

Vagg, P. R., & Spielberger, C. D. (1998). Occupational Stress: Measuring job pressure and organizational support in the workplace. *Journal of Occupational Health Psychology, 3,* 294-305.

Van Harrison, R. (1978). Person-environment fit and job stress. In C. L. Cooper & R. Payne (Eds.), *Stress at work* (pp. 175-205. Chichester: John Wiley & Sons.

Vinokur, A., & Selzer, M. L. (1975). Desirable versus undesirable life events: Their relationship to stress and mental distress. *Journal of Personality and Social Psychology, 32,* 329-337.

Vogel, W., Raymond, S. & Lazarus, R. S. (1959). Intrinsic motivation and psychological stress. *Journal of Abnormal and Social Psychology, 58,* 225-233.

Vroom, V. H. (1964). *Work and Motivation.* New York: John Wiley & Sons.

Wall, T. D., Jackson, P. R., Mullarkey, S., & Parker, S. K. (1996). The demands—control model of job strain: A more specific test. *Journal of Occupational and Organizational Psychology, 69,* 153-166.

Wall, T. D., Kemp, N. J., Jackson, P. R., & Clegg, C. W. (1986). Outcomes of autonomous workgroups: A long-term field experiment. *Academy of Management Journal, 29*, 280-304.

Walsh, J. J., Wilding, J. M., Eysenck, M. W., & Valentine, J. D. (1997). Neuroticism, locus of control, Type A behaviour pattern and occupational stress. *Work & Stress, 11,* 148-159.

Wampold, B. E., & Freund, R. D. (1987). Use of multiple regression in counseling psychology research: A flexible data-analytic strategy. *Journal of Counseling Psychology, 34,* 372-382.

Warwick, D. P., & Lininger, C. A. (1975). *The sample survey: Theory and practice.* New York: McGraw-Hill.

Webster, J. & Starbuck, W. H. (1988). Theory building in industrial and organisational psychology. In C. L. Cooper & I. Robertson (Eds), *International Review of Industrial and Organisational Psychology 1988* (pp. 93-138). Chichester: John Wiley & Sons.

Weiss, D. J. (l976). Multivariate procedures. In M. D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 327-362). Chicago: Rand-McNally.

Westman, M. & Eden, D. (1996). The inverted-U relationship between stress and performance: a field study. *Work & Stress, 10,* 165-173.

Williams, T., & Clarke, V. A. (1997). Optimistic bias in beliefs about smoking. *Australian Journal of Psychology, 49*, 106-112.

Williams, S., & Cooper, C. L. (1998). Measuring occupational stress: Development of the Pressure Management Indicator. *Journal of Occupational Health Psychology, 3*, 306-321.

Wolfe, D. M., & Snoek, J. D. (1962). A study of tensions and adjustment under role conflict. *The Journal of Social Issues, 18,* 102-121.

Wolff, H. G. (1953). Stress and Disease. Springfield, Illinois: Charles C Thomas Pub.

Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist, 35*, 151-175.

Zajonc, R. B. (1984). On the primacy of affect. *American Psychologist, 39*, 117-123.